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12 June 1980

Worldwide Report

ENVIRONMENTAL QUALITY

No. 256

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BRIEFS

WEST BERLIN, GDR HOLD TALKS--Berlin--Talks on the prevention of water pollution between experts of the Berlin Senat and the GDR began here today. According to Senat spokesman Hermann Meyn, experts from the building administration of the Senat and the GDR Ministry for the Protection of the Environment and Water Economy met in West Berlin for a talk lasting about 1 hour on preventing the pollution of the Havel and Spree. The meeting took place in a "businesslike atmosphere." The date for the next meeting will be fixed later. [Excerpt] [LD080854 Hamburg DPA in German 1543 GMT 7 May 80]

GDR TALKS IN HELSINKI--Helsinki--GDR Minister for Environmental Protection Dr Hans Reichelt, who is currently in Helsinki as leader of a GDR delegation to the first meeting of the Joint Baltic Commission, was received today by Dr Johannes Virolainen, president of the Finnish Diet and chairman of the Finnish Center Party. The talks held by Dr Hans Reichelt with Johannes Koikkalainen, second minister of the interior responsible for questions on environmental protection, centered on bilateral and multilateral cooperation in protection of the environment and water management. The two ministers underlined the importance of the Baltic convention which came into force on 3 May; the promotion of peaceful cooperation in the Baltic; the protection of the marine environment; and of improving the political climate in Europe. [Excerpts] [LD080920 East Berlin ADN International Service in German 1924 GMT 7 May 80]

CSO: 5000

GANDHI TOLD CENTRAL ENVIRONMENT AGENCY NEEDED

Bombay THE TIMES OF INDIA in English 4 Apr 80 p 17

[Text] New Delhi, April (UNI)--The creation of a centralised agency headed by the Prime Minister, Mrs. Indira Gandhi, has been suggested by top ecologists and naturalists of the country to look into problems of environment in a co-ordinated manner.

The environmentalists, who met Mrs. Gandhi for over an hour at the latter's invitation, pointed out how this responsibility was now being shared among 16 different ministries and authorities.

They did not specify whether the suggested agency should be a separate department or a division in the Prime Minister's office.

Opening the meeting, Mrs. Gandhi said the problem of environmental pollution was getting aggravated day by day and the ecologists should, therefore, identify the areas requiring immediate action. Long-term measures could be thought out later to deal with this problem.

The experts who attended the meeting included Dr. Dharmakumar Singhji, Mr. Madhav Gadgil, Mr. Duleep Mathai, Dr. Lalith Nath, Mr. Digvijay Singh and Mr. K. P Singh Deo, MPs, Mr Sunderial Bahuguna, Mr. Arian Singh, Zafar Futehally, Dr. Nilai Chaudhury, Dr. B. P. Pal, Dr. R. S. Mehta, and Mr. H. S. Pawar.

Officials who participated included Mr. Krishnaswami, Mr. B. B. Vohra, Prof. M.G.K. Menon and Mr. N. D. Jayal.

The discussion covered a wide range of issues relating to preservation of environment including land and water, protection of wild life and preventing the denudation of forests.

Silent Valley Plants

Dr. Pal, who is an eminent botanist, stressed the need to ensure that productive forestry did not lead to needless felling of trees. He emphasised the importance of protecting genetic plants which abounded in Silent Valley. He said that a threatened devastation of rice crop in Indonesia had been averted by the use of some genetic plants from Silent Valley.

He said certain localities which were having these genetic varieties of plants should be identified and no development projects whatsoever should be permitted in the region.

Dr. Pal said that the north-eastern states in particular had one of the most important collection of genetic plants in the world.

Mr. Sunderial Bahuguna, who spearheads what is known as the "Chipko movement" in UP, said there should be a total ban on cutting of trees beyond a defined height. He suggested a programme of tree-planting conforming to the five guidelines enumerated by him--food, firewood, fodder, fibre and fertilizer. He did not think there was much use of planting eucalyptus trees.

It was pointed out at the meeting that out of 142 cities in the country, neary 70 had no sewerage facilities whatsoever. It was also said that industry accounted for only ten per cent of the pollution of waters. The rest was because of lack of sewerage.

It was suggested that the concept of social forestry should be promoted and allocations for the purpose be made by the Centre. At present, this subject was with the states.

Winding up the discussion, the Prime Minister said that only when the people's real needs were fulfilled, efforts to tackle the environmental problem would succeed. There was need to educate the people and popularise the idea of environmental protection.

CSO: 5000

'KYODO' ON WHITE PAPER ON THE ENVIRONMENT

Tokyo KYODO in English (no time given) 16 May 80 OW

[Text] Tokyo May 16 KYODO--The nation has to fight public pollution mainly in urban life in the 1980s, a government white paper on the environment pointed out Friday.

This year's annual white paper was reported by Yoshihiko Tsuchiya, director general of the environment agency, at a cabinet meeting Friday and approved at the meeting.

The white paper said environmental pollution has moved out of the serious stage and was showing improvement on the whole with rapid development in anti-pollution measures in the 1970s, but efforts for further improvement are required in the 1980s.

On the other hand, the white paper said public pollution in urban life, such as traffic, noise and waste is on the increase because of the gravitation of pollution toward cities.

The paper called for further progress in policies to prevent pollution in advance in the 1980s instead of ex post facto reactions to pollution.

As to the present conditions of pollution in Japan, the paper claimed sulphur dioxide (SO2) and carbon monoxide among air pollution factors were showing continued improvement and that water contamination was steadily improving.

The paper cited a report filed by the Organization for Economic Cooperation and Development (OECD) pointing out Japan's marked improvement in SO2 air contamination as of 1976.

As environmental policies for the 1980s, the paper called for advance prevention of pollution, solid anti-pollution measures with development and utilization of substitute energy for oil, promotion of policies on urban structures.

The paper also reported on the geographical distribution of eight species of wild animals such as Japanese bears, deer and Japanese monkeys on the verge of extinction in some areas of the country.

This is the nation's first "census" on wild animals taken through interviews with local residents across the country between April 1978 and March 1979.

Hokkaido brown bears, for example, died out in wide areas of Kosen- and Sabobetsu-genya moors of Hokkaido, the report said.

CSO: 5000

SNOW, DUSTSTORMS BRING HUMAN, LIVESTOCK LOSSES

Aid Sent to Area

OW290131 Ulaanbaatar MONTSAME in Russian 1847 GMT 26 Apr 80

[Text] Ulaanbaatar, 26 Apr (MONTSAME)--A natural disaster caused by unusually strong snow and duststorms struck seven aymags in the MPR between 17 and 20 April this year. Particularly strong snowstorms which lasted for 3 days hit the territories of Suhbaatar, Hentiy, and Dornod aymags where wind velocities in some areas exceeded 40 meters per second.

According to preliminary reports 500,000 head of livestock perished, including newborn livestock, many buildings, yurts, and livestock shelters. Communications and electric power transmission lines were damaged and in a number of places pastures were stripped of vegetation. Considerable losses occurred and the natural disaster caused loss of human lives in these aymags.

A government commission for liquidating the consequences of the natural disaster has been established and central and local party, state, and agricultural authorities are taking effective measures on the spot to help the disaster-stricken farms and population.

Soviet organizations operating in the country are rendering fraternal and internationalist assistance in the struggle with the calamity and in liquidating its consequences.

Livestock breeders and workers are continuing efforts to save livestock lost owing to the storm or buried by snowdrifts and are selflessly striving to liquidate the consequences of the natural disaster in the shortest possible time.

Council of Ministers' Condolences

OW290133 Ulaanbaatar MONTSAME in Russian 1850 GMT 26 Apr 80

[Text] Ulaanbaatar, 26 Apr (MONTSAME)--The natural disaster caused by the unusually strong snow and duststorms which hit the territories of Suhbaatar, Hentiy, Dornod and some other Mongolian aymags between 17 and 20 April this year, resulted in loss of human life. The MPRP Central Committee and MPR Council of Ministers have expressed profound condolences to the families and relatives of the victims.

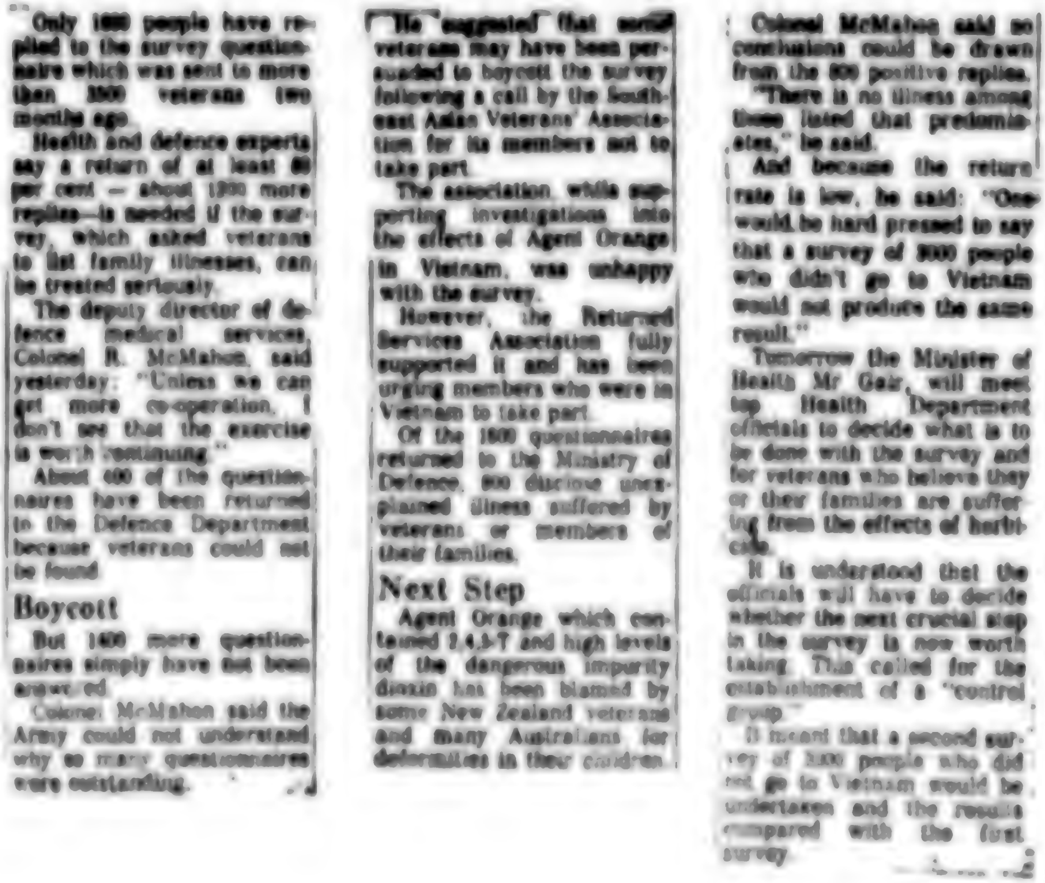
CSO: 5000

AGENT ORANGE SURVEY OF VIETNAM VETERANS DROPPED

Poor Survey Response

Auckland THE NEW ZEALAND HERALD in English 13 May 80 p 3

[Text] Wellington (Press Association)--The Army's massive survey to find if New Zealand Vietnam War veterans were affected by the herbicide Agent Orange may be abandoned.



Only 1800 people have replied to the survey questionnaire which was sent to more than 3500 veterans two months ago.

Health and defence experts say a return of at least 80 per cent — about 1000 more replies—is needed if the survey, which asked veterans to list family illnesses, can be treated seriously.

The deputy director of defence medical services, Colonel R. McMahon, said yesterday: "Unless we can get more co-operation, I don't see that the exercise is worth continuing."

About 400 of the questionnaires have been returned to the Defence Department because veterans could not be found.

Boycott

But 1400 more questionnaires simply have not been answered.

Colonel McMahon said the Army could not understand why so many questionnaires were outstanding.

He suggested that some veterans may have been persuaded to boycott the survey following a call by the South-east Asian Veterans' Association for its members not to take part.

The association, while supporting investigations into the effects of Agent Orange in Vietnam, was unhappy with the survey.

However, the Returned Services Association fully supported it and has been urging members who were in Vietnam to take part.

Of the 1800 questionnaires returned to the Ministry of Defence, 800 disclose unexplained illness suffered by veterans or members of their families.

Next Step

Agent Orange which contained 2,4,5-T and high levels of the dangerous impurity dioxin has been blamed by some New Zealand veterans and many Australians for deformities in their children.

Colonel McMahon said no conclusions could be drawn from the 800 positive replies.

"There is no illness among those listed that predominates," he said.

And because the return rate is low, he said: "One would be hard pressed to say that a survey of 3500 people who didn't go to Vietnam would not produce the same result."

Tomorrow the Minister of Health Mr Gair, will meet top Health Department officials to decide what is to be done with the survey and for veterans who believe they or their families are suffering from the effects of herbicide.

It is understood that the officials will have to decide whether the next crucial step in the survey is now worth taking. This called for the establishment of a "control group."

It meant that a second survey of 3500 people who did not go to Vietnam would be undertaken and the results compared with the first survey.

SURVEY ON WRONG BASIS

Wellington THE EVENING POST in English 14 May 80 p 40

[Text] THE cancelled Agent Orange survey was undertaken on the wrong assumption that defoliant spraying only began late in the Vietnam War, two Cabinet Ministers revealed this morning. Explaining their decision to call off the Ministry of Defence survey, the Minister of Health (Mr Gair) and the Acting Minister of Defence (Mr Thomson) revealed that New Zealand soldiers could have been exposed to Agent Orange from the moment they arrived in Vietnam. "Initially it was thought that spraying of the defoliant commenced in 1968, thereby allowing New Zealand veterans to be split statistically into two groups, one non-exposed and one potentially exposed. Subsequent U.S. information, however, has indicated that spraying began in 1962 and continued until 1971. As a result, it is not possible to establish a control group of non-exposed veterans," the Ministers said. Last week it was reported that fewer than half of the New Zealand veterans surveyed had replied to the questionnaire sent out by the Ministry of Defence. The survey was undertaken as a matter of urgency by the Ministry after a February meeting between Mr Gair and the Minister of Defence (Mr Gill). A total of 3552 questionnaires were sent out. The Ministers said that they would now keep a watch for the results of "more sensitive" U.S. and Australian studies.

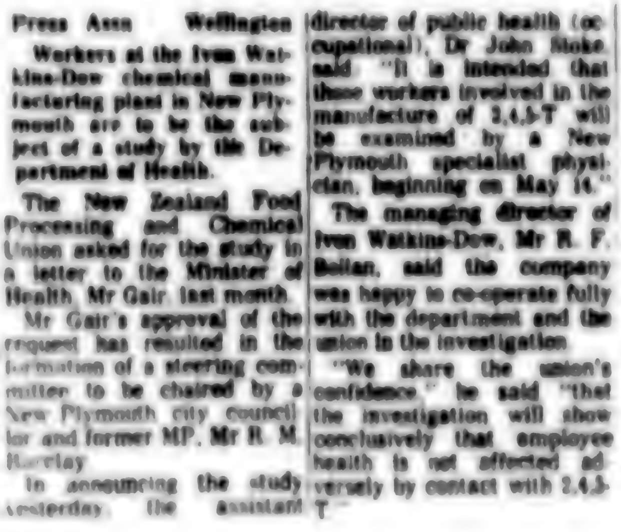
CSO: 5000

NEW ZEALAND

HEALTH DEPARTMENT TO STUDY WORKERS HANDLING 2,4,5-T

Auckland THE NEW ZEALAND HERALD in English 7 May 80 p 10

[Text]



Press Assn Wellington

Workers at the Ivan Watkins-Dow chemical manufacturing plant in New Plymouth are to be the subject of a study by the Department of Health.

The New Zealand Food Processing and Chemical Union asked for the study in a letter to the Minister of Health, Mr Gair, last month.

Mr Gair's approval of the request has resulted in the formation of a steering committee to be chaired by a New Plymouth city councillor and former MP, Mr R. M. Barclay.

In announcing the study yesterday, the assistant director of public health (occupational), Dr John Stoke, said: "It is intended that those workers involved in the manufacture of 2,4,5-T will be examined by a New Plymouth specialist physician, beginning on May 14."

The managing director of Ivan Watkins-Dow, Mr R. F. Bollan, said the company was happy to co-operate fully with the department and the union in the investigation.

"We share the union's confidence," he said, "that the investigation will show conclusively that employee health is not affected adversely by contact with 2,4,5-T."

CSO: 5000

FARMERS GROUP VOTES TO FIGHT BAN ON USE OF 2,4,5-T

Auckland THE NEW ZEALAND HERALD in English 7 May 80 p 5

[Report by HERALD agricultural staff]

[Text] Auckland farmers are worried over possible bans on the use or handling of the herbicide 2,4,5-T resulting from what they see as emotive campaigns against the chemical.

At the annual conference of the Auckland Federated Farmers yesterday they voted unanimously for the federation to actively combat "efforts to have 2,4,5-T banned by emotive campaigns designed to arouse public concern while ignoring responsible scientific evidence."

It was apparent that many farmers regard the chemical as indispensable in the fight against gorse.

The conference was told that a ban on 2,4,5-T would mean farmland now capable of carrying seven million stock units reverting rapidly to gorse.

Several speakers were adamant that they would not use the chemical if they believed it posed a threat to their families, stock or neighbours.

One said he was mystified by the recent campaign against the New Zealand product. He had been using the product for 30 years and had never had any side-effects show up in his animals.

Mr M. R. Tylden, president of the Bay of Islands sub-province of the federation, said his standard reply to critics of the chemical was the case of a man employed spraying roadside gorse with the chemical in the Hokianga County.

"For many years he has been literally bathed in the chemical every day," he said. "At the same time he has sired 14 children and they are all as healthy as crickets."

Mr V. Mackreth, of Whitianga, said he suspected some of the pressure to ban 2,4,5-T was coming from growers of cannabis. The plant was highly susceptible to the herbicide.

The Auckland Federated Farmers' spokesman on the chemical, Mr H. A. S. Lloyd, said he did not believe a public inquiry into 2,4,5-T would solve anything.

The evidence coming forward could only be properly evaluated by experts such as toxicologists and paediatricians.

Laymen were simply not in a position to judge the worth of reports made on the subject, he said. They could not judge the quality of the research involved, whether the conclusions reached were justified by the scientific evidence quoted, or whether some vital matters had been left out.

CSO: 5000

WATERLOGGING, SALINITY MENACE SIND

Karachi MORNING NEWS in English 22 May 80 p 4

[Text] The waterlogging and salinity problem is getting pretty serious in Sind. Every hour another twelve acres of canal irrigated land is converted into uncultivable swamp. No wonder then that out of 10.35 million acres of canal irrigated area in this province, six million acres have been devoured by the twin-headed monster. The situation has become all the more grim due to the slow rate of reclamation. While some 40,000 acres of land are being rendered uncultivable in Sind every year, only 60,000 acres are reported to be reclaimed. Since there was already a heavy backlog of about four million acres when the major reclamation work had started in 1965, the problem is assuming menacing proportions with every passing day. More so, because of the slowing down of the anti-waterlogging campaign in the province due to the paucity of funds.

Although Kotri Barrage Surface Drainage Scheme was started in 1959, only two million acres could be partially covered by the drain out of 2.7 million acres of cultivable land in the past 20 years. Besides this scheme, other on-going programmes and projects include tubewells project, surface drainage projects and tile drainage projects. Some of these programmes are being implemented by WAPDA, while others are being looked after by the provincial Irrigation Department. There has been little progress of these projects which give rise to the fear that the battle may be lost against the speed with which the twin menace is spreading. The main snag is the nonavailability of funds. It is due mainly to the lack of resources that the work on major projects like Left Bank Outfall Drain has virtually come to a standstill. Indisputably, unless the project is given priority and the Federal Government comes to the rescue of WAPDA and the provincial government, the situation cannot be retrieved. The fast deteriorating situation clearly underlines the need for Federal Government's assistance to the tune of Rs. one crore of WAPDA and Rs. 3 crore to the Sind Government. Without this aid, the work on these projects cannot be continued and thus the future of agriculture in Sind will be gravely jeopardised. It is also high time that the loans offered by the Asian Development Bank and the West

German Government for the Ghotki Fresh Water Scheme and SCARP South Rohri were accepted without delay.

There is no gainsaying the fact that speedy reclamation of this land will greatly increase farm output in Sind. According to an estimate, the production may go up three times immediately if the waterlogged land is retrieved and made cultivable once again. According to experts, the problem is so serious that if the anti-waterlogging programme does not take off due to the non-availability of funds in the forthcoming budget agriculture will be badly affected in the province. It is a pity that although the problem has been under study since the mid-sixties, the reports submitted by various foreign experts and consultants have not been considered and implemented. The first phase of the Accelerated Programme which was originally expected to be over by 1985, may be over at the present pace of work by 1995. This will lead to a manifold increase in the original cost estimated at Rs. 1400 million. It is therefore to be hoped that something will be done and quick to reclaim the land rendered uncultivable by the creeping menace of waterlogging and salinity.

CSO: 5000

BRIEFS

SEA POLLUTION SURVEY--China has successfully completed its first large-scale survey of pollution in the East China Sea through joint efforts of departments concerned of Jiangsu, Zhejiang and Fujian provinces and Shanghai Municipality and of the State Oceanography Bureau. The survey covered an area of 115,000 square kilometers. [Shanghai City Service in Mandarin 2300 GMT 16 Apr 80 OW]

HUNAN ENVIRONMENTAL PROTECTION MEETING--The Hunan Provincial People's Government held a report meeting in Changsha on 2 April on environmental protection. Comrade Liu Fusheng, vice provincial governor, spoke at the meeting. He said: "It is an urgent task to protect the environment and limit industrial pollution as much as possible. Whether the task can be fulfilled or not depends on the efforts of the leading cadres at all levels. Some comrades still cannot see the importance of environmental protection but simply treat it as an economic burden. As a matter of fact, due to the backwardness of industrial techniques and equipment in some enterprises, a lot of energy and materials become waste in the course of production, and pollute the environment. Thus, it is worth spending a certain amount of investment in dealing with this pollution and making use of the industrial waste, since this is a major measure for preventing environmental pollution and for increasing production and practicing economy. [HK200747 Changsha Hunan Provincial Service in Mandarin 2315 GMT 12 Apr 80 HK]

HANGZHOU COMBATS ENVIRONMENTAL POLLUTION--Hangzhou, 12 Apr--A series of stringent measures are being introduced to eliminate environmental pollution in the lake city of Hangzhou and in other parts of Zhejiang in 2 or 3 years, according to the province's environmental protection department. Among the measures taken are the building of a project to cut off the sources of sewage at West Lake, and the planting of trees in the gardens and mountains around the lake. In addition, pleasureboats on the lake no longer use gasoline and diesel oil. The city has also decided to draw water from the Qiantang River to the West Lake and from these to the rivers that run through the city, in order to reduce pollution. Penalty clauses have been announced for factories and enterprises in the city, if they do not drain sewage in a way that prevents environmental pollution. Zhejiang Province has announced rules and regulations for the protection of four natural preservation areas, eight water sources, and China's major fishing center of Zhoushan, as well as West Lake. [OW141249 Beijing XINHUA in English 0712 GMT 12 Apr 80]

SHANDONG OILFIELD CONTROLS POLLUTION--The Shengli oilfield in Shandong Province has done well in preventing environmental pollution by the large quantity of waste water discharged daily from its oil extraction process. The oilfield now has 14 waste water disposal installations which are capable of treating 125,000 cubic meters of waste water daily. In fact, over 60,000 cubic meters of waste water are treated daily by these installations before it is discharged into streams and channels which ultimately lead to Bohai Bay. Through the treatment process, some 10,000 tons of crude oil can be recovered annually from the waste water. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 18 Mar 80 SK]

HUBEI WATER MONITORING VESSEL--Wuhan, March 21--A vessel specially designed to test and monitor the quality of water is now in operation between Shanghai and Chongqing (Chungking) to provide scientific data for pollution research and prevention on the 6,300-kilometre Yangtze River, the longest in China. Manned by a crew of 40, this 500-ton vessel has completed its first trial-run. It is the first of its kind ever built in China. The laboratories on board the ship conduct tests on water samples obtained from different depths of the river and record the results automatically. Pollutants are discovered, calculated and their origin traced through chemical tests on water samples and analysis of radio-activity as well as of their biological properties. The ship is a key scientific research project planned by China for its modernization. The designing and building of the ship involved the efforts of more than 30 units throughout the country, including factories, research institutes and schools of higher learning. [Text] [OW222015 Beijing XINHUA in English 0825 GMT 21 Mar 80 OW]

CSO: 5000

POLLUTION IN KANGWON MINE AREA CAUSES ECOLOGICAL CHANGES

Seoul THE KOREA TIMES in English 20 May 80 p 8

[Text]

A group of pollution investigators has been sent to a Kangwon-do mining area to dig into the detailed causes of environmental contamination there, the Office of Environment announced yesterday.

OE officials said that the probe team consisting of experts from the National Institute for Environmental Studies and the office would determine the causes of the pollution of the Kosu-gol Valley where various ecological changes have occurred apparently due to pollutants from a nearby mine.

According to reports from Samchok, the abnormal changes include waters in nearby streams which never freeze even during the peak cold of winter, extinction of fish, and deaths of livestocks. Chickens and cattle have died of unknown causes after developing hypertrophy in the liver.

The reports quoted farmers in the area as claiming that crop harvests had declined by some 30 percent in fields which use water from streams in the vicinity of Kosu-gol Valley.

The OE-NIES probe team will determine how far the environmental deterioration has gone, and study the contamination of crops and livestock by pollutants and will conduct precise check-ups of the health of residents in the area.

The team will also find out whether waste water from the Yonhwa Mine has been absorbed into the underground water and if the waste disposal at the mine has been properly operated.

The Yonhwa Mine located on the mid-slope of the 1,083-meter Yŏnhwa-bong Peak has been in business since Nov. 25, 1961, by the Young Poong Mining Co. and has been refining lead and zinc.

CSO: 5000

CZECHOSLOVAKIA

DISPOSAL OF WASTE FROM NUCLEAR POWER PLANTS

Bratislava LUD in Slovak 11 Apr 80 p 5

[Article by Tana Kelcova: "What to Do with Nuclear Power Plant Wastes?"]

> [Text] When we take a look into the past this year and recall the 35th anniversary of the liberation of our fatherland by the glorious Soviet army, we cannot but also notice the 35-year long developmental path of Czechoslovak power engineering. Provide all people with work, bread and secure for them a happy future... that was the resolution of not only the Communist Party of Czechoslovakia, but of all the people who responsibly undertook restoration of our national economy decimated by WWII.

At the outset of the peacetime stage of build-up and restoration, the republic had less than 2,500 megawatts of installed electric capacity. Today, power plants show an output of 16,400 MW, 6.5 times the postwar capacity. And last year Czechoslovak power plants generated a total of .68 TWh of electricity, up to 12 times more than in 1946. The stages of implementing the energy base did not meet only with success. In many places there were bottlenecks in coordinating construction and assembly operations, causing delays in launching operations in plants, supply and distribution of electric power were lagging, and consumption of primary resources was increasing. Satisfactory meeting of the increasing energy consumption, however, served to obscure the need for paying sufficient heed to implementation of long range plans for developing a power generation base, as well as prospecting for and opening up new reserves of bituminous and brown coal, or lignite, and ores. At the transition of the 1960's and the 1970's, the long range concept for the development of Czechoslovak power engineering, which counted on the development of power plants based on utilizing the special-purpose type of coal from the North Bohemian coal basin, became the subject of considerable anxiety.

The way out of this distressing situation was provided by the resolutions of the CPCZ 14th Congress. Attention was focused not only on constructing new power plants, but also on developing a transmission system for uninterrupted distribution of electricity. However, it was not until the Sixth Five-Year Plan that the decisive answer to solving the long range concept of providing for the needs of power consumption was given. The electrification system received a substantial boost. From 1976 up to the end of 1979, power operations were supplemented, in addition to other smaller sources, by 3,236 MW of new power plant output. E. g., 600 MW from the power plant in Detmarovice, 220 MW from Novaky III, 400 MW from Pocerady II, 800 MW from Chvaletice and 409 MW from the pumped-storage hydroelectric power plant in Dalesice.

An historical milestone in our modern power engineering was attained last year with the launching into operation of the first reactor of the nuclear power plant in Jaslovske Bohunice with an output of 452 MW. Czechoslovakia thus entered the path of peaceful utilization of atomic energy, building nuclear power plants which in the future are to cover a substantial part of increases in consumption. An important role in the nuclear energy program among CEMA countries is played also by Czechoslovak machinery production plants which incorporated into their production the task of supplying technological systems for nuclear power plants. An important step in the area of cooperation with CEMA countries was represented also by implementation of the Central Dispatching Organization of the interconnected electric power systems of member countries.

But let us return once again to the characteristics of our contemporary power engineering and its future prospects.

In the immediate future, the inevitable increase of planned outputs and generation of electric power will be covered primarily by nuclear power plants. Statistics of the Federal Ministry for Fuels and Power Engineering show that in the current year the ministry's power plants will generate 64 billion kilowatt-hours, and nuclear power plants 3.3 billion. It is envisioned that in 1990 the generation of electric power will be up to 110 billion kWh, 42 billion kWh of which will be provided by nuclear power plants. This form of development is inevitable, because by then the major part of our fossil fuel reserves will have been exhausted. It is anticipated that upon completion of the power plants now under construction, Prunerov II and Melnik III, construction of large conventional thermal power plants will no longer be contemplated. Launching of the second reactor at the nuclear power plant in Jaslovske Bohunice is expected any time now. Another nuclear power plant will be erected in the vicinity of Dukovany and preparations for the construction of a power plant in Mochovce near Levice are under way. It is in the latter location that it is planned to provide a regional storage of low- and medium-level radioactive waste for all the "nukes" in Slovakia. And, to discourage dissenting opinions by laymen, we shall acquaint you in closer detail with "wastes" from nuclear power plants:

They can be routinely classified into active and inactive. It is known that the efficiency of contemporarily built condensation power plants, particularly nuclear power plants, ranges around 30 percent. I. e., an average of

70 percent of thermal energy released from the fuel is dissipated into the surroundings. This heat not only remains unused, but, moreover, presents certain ecological problems. How are we then to make use of waste heat? First of all, for heating of civic and industrial buildings, the transport medium here being water. This "means of transportation" was selected in view of the given parameters of the secondary circuit of nuclear power plants and the need for a higher degree of radiation safety in the tertiary circuit. It will be possible to use hot water for heating either directly or through existing subscriber heat exchange stations. In the future it is planned to use the heat from nuclear power plants for heating not only the surrounding localities, but also large population centers such as Prague, Brno and Bratislava.

Utilization of safe, hot waste water from nuclear power plants has already proved successful in several countries, particularly for agricultural purposes. The results have shown that waste water can be used for irrigation just as well as normal water, even protecting plants against frostbite in winter and wilting in the summer.

And what about other wastes?

Gaseous inactive wastes not containing any harmful substances will be released into the atmosphere during normal plant operation. Thus it can be categorically stated that from the ecological viewpoint, nuclear power plants are cleaner by far than are conventional thermal power plants. Active gaseous exhalations will be siphoned off from active areas by air conduction systems containing devices for filtering out solid radioactive particles. Those particles that escape the filters will be conducted into gas tanks where they will be diluted and neutralized, should they exceed the admissible standards for release into the atmosphere. Liquid inactive waters will be channelled into central collectors and from there to processing stations. Active liquid wastes will be trapped by means of hygienic loops. Active components by cleaning agents [as published]. Technological water--the surface blowdown from steam generators--from the primary circuit will have its own drainage system and independent processing stations. Thickening and evaporation systems will be installed in a closed circuit. Solid inactive waste will be constituted by regular refuse as in any factory. In spite of that, it will be controlled and kept in a sludge dump. There are many types of solid active wastes from nuclear power plants. The main types include cleaning agents for deactivation of instrumentation, work clothes, equipment parts, liquid waste thickened to solid state, RA filters, and spent fuel rods. These will be disposed off in an independent facility, an incinerating plant equipped with a filtration system, etc. Radioactive waste will be thickened and processed on bitumen and cementation lines. There it will be hermetically sealed. Then it will be packed into metal drums and the latter sent to the above mentioned regional waste storage. A lot could be written and said about the safety measures used by the nuclear power plants system. In the first place, it ought to be pointed out that scientists, researchers and operational personnel regard the system as perfect and rule out the possibility of any accidents. And what if one should occur anyway? We know that the entire complex would hermetically close and seal itself off.

However, we must concentrate more on the rich prospects that peaceful utilization of atomic energy holds in store for our industry in the future. First of all, it will provide sufficient energy for social enterprise, for increasing production while minimally affecting the environment. Since we are among the small number of the world's countries that are fast adopting the demanding nuclear energy program, it is up to us how well we use it.

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BRIEFS

FOREST DAMAGE--Air pollution from local industry, as well as foreign sources, has caused damage to about 60 percent of timber in North Bohemia Kraj forests. Sulphur dioxide is the main pollutant, followed by fluorine compunds and emissions from coal, chlorine and heavy metal sources. Yearly losses amount to about 68,000 solid cubic meters of lumber; the water resources in the forests are also affected. Reforestation of more than 4,000 hectares of timber-producing areas will be necessary. [Prague ZEMEDELSKE NOVINY in Czech 29 May 80 p 6]

DYING LAKE--Cerne Jezero [Black Lake], a favorite tourist spot in Sumava Mountains, has become a victim of acid rain. Burning of coal produces sulfur dioxide and certain nitrogen oxides which later return to ground in form of acid rain containing sulfuric acid and nitric acid. The lake's acidity in 1936 measured pH 7, in 1961 about 5.5 and in June 1979 only 4.5-4.8. Since even the most resistant species of fish cannot successfully breed in water of acidity under pH 5, most of the fish in the lake died. A few old American char might have survived, but even their days are numbered. Oxidation in the lake has also changed composition of its plankton and increased the water transparency fivefold. In 1980, experts from the Charles University Department of Natural Sciences will continue investigating this condition in the lake on a monthly basis. [Prague SVOBODNE SLOVO in Czech 24 May 80 p 10]

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BUENOS AIRES TO HOST INTERNATIONAL ANTIPOLLUTION MEETING

Buenos Aires CONVICCION in Spanish 19 Apr 80 p 7

[Text] The struggle for environmental recovery will have its headquarters in Buenos Aires in October, when the Fifth International Clean Air Congress meets.

Evidence of the logical concern with which the whole world, and the highest scientific levels also, view the efforts to prevent environmental pollution, is to be found in the 343 documents, prepared by 590 experts from 27 countries, received thus far by the organizing committee of the Fifth International Clean Air Congress, to be held in Buenos Aires from 20 to 25 October. This meeting, by reason of the great significance of the subject matter and the participation of eminent scientists who have promised to attend, will afford Argentina an outstanding place in the search for the solutions which so grave a problem requires. Fully aware of its importance, the nation's government and the municipal authority of the city of Buenos Aires have declared the meeting to be in the national and municipal interests, respectively. In turn, the local authority freely granted the installations of the Centro Cultural General San Martin for the meetings, thus contributing to the success of the program formulated for the celebration of the Fourth centenary of the foundation of the city of Buenos Aires.

Just as occurred with the previous meetings held in London (1966), Washington (1970), Dusseldorf (1973) and Tokyo (1977), this congress was convened by the International Union of Associations for Prevention of Air Pollution (IUAPPA), which represents a group of 26 associations in several different countries. Among these figures the Argentine Clean Air Association which is now responsible for the organization of the congress. In addition to the presence of the Argentine experts, and those from abroad, anticipated at the meeting, there will be 9 scientists from Latin America, Asia and Africa whose attendance is being sponsored by the UN Environmental Program (UNEP) and 50 other well-known persons who have made their mark in the struggle to recover and maintain pure air standards, and who were invited by the municipal authorities of Buenos Aires.

Concurrently with the congress, and at its headquarters, there will be an exhibition of the most modern systems and equipment that world science and technology have produced in connection with so vital a subject. The general secretariat for the congress will be located at 1115 Corrientes Avenue, 2nd floor, Buenos Aires (Federal capital) Tel 35-1594/7373.

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BRAZIL

SCOPE OF ENVIRONMENTAL PROBLEMS IN RIO DE JANEIRO ASSESSED

Rio de Janeiro O GLOBO in Portuguese 4 May 80 p 22

[Text] Pollution of all kinds of the Paraiba River, deforestation on the mountains, excessive noise in the large cities, silting in the lagoons, dumping of toxic products and wastes in the water, in a word almost all of the types of environmental problems have been found in the state of Rio in a survey made by a number of technicians for the Plan for the Preservation of the National Assets of the State (PRENAT).

This work, in which technicians from various state secretariats and bodies participated, resulted in a detailed study of all the environmental problems in the state, with specific solutions suggested. For the purposes of surveying and drafting the map, the technicians divided the state into six regions (North, Coastal Lowlands, Middle Paraiba Industrial Zone, Mountains, Southern Coastal and Metropolitan).

In all the regions, they say, there are "serious difficulties of an environmental nature and the ecological problems are mutliplying," mainly because of the wide variety of physical characteristics which "entails greater environmental fragility."

The Problems

In the North region, covering Campos and various other municipalities, the main problems are pollution and silting of the Paraiba River, and the dumping of 1.5 billion liters of bagasse in the water annually (by 1985, with the incentives for alcohol production, the total will be 10 billion liters, the technicians say).

In the Coastal Lowlands region (Cabo Frio, the Lagos region and environs), silting is hastening the disappearance of the lagoons. In the Mountain region (Nova Friburgo, Teresopolis and other municipalities) indiscriminate deforestation is threatening even the water sources which supply urban centers. In the Middle Paraiba Industrial Zone (Volta Redonda, Barra Mansa and others) the river--which gives rise to the Guandu and supplies water to more than 80 percent of the population of the state--is being polluted by industrial wastes and sewage, including highly toxic products.

On the Southern Coast (covering mainly Angra dos Reis) the building of the highway between Rio and Santos has intensified the clearing, hillside erosion and pollution of the beaches. And in the Metropolitan region, with more than 8 million inhabitants, almost all of the environmental problems are to be found: industrial pollution, hillside erosion, spillage of oil products and chemical and organic wastes into Guanabara Bay, as well as excessive noise in the city.

The Survey

The PRENAT work, undertaken on the basis of studies already in existence, was carried out by the director of the Technical-Scientific Support Department of the State Environmental Engineering Foundation (FEEMA), engineer Ricardo Silveira; Prof Murilo Alves da Cunha, of the state education secretariat; architect Joao Ricardo Serran, also of the FEEMA; with Prof Roberto Ballalai, of the State Culture Council, president of the PRENAT, as coordinator.

The PRENAT is a joint undertaking of the state secretariat of education, public works and agriculture, the FEEMA and the State Culture Council, with the support of O GLOBO.

Pollution of the Paraiba in the North

One of the major problems in the North region is the pollution and silting of the Paraiba River. The pollution comes from other regions, for this is the lowest section of the river, suffering the effects of the wastes from the states of Sao Paulo and Minas Gerais (through the Paraibuna, Muriae and Pomba, its tributaries) and other regions in the state of Rio itself.

The silting is caused by the indiscriminate removal of sand from the river bed and also by the correction projects undertaken with a view to the utilization of areas for agriculture. They are generally low and marshy areas brought under control by the building of canals. This leads to greater water velocity and carries particles into the bed of the river which settle there.

According to engineer Ricardo Silveira of the FEEMA, the solution to this "imported pollution" would be to regulate the building of industrial facilities in the Paraiba Basin on a selective basis.

There is a commission--the CEIVAR--with technicians from Sao Paulo, Minas Gerais and the state of Rio studying and proposing overall solutions to the problem as a whole. The solutions recommended have been along the lines of requiring industries to treat wastes in natura and to prevent the establishment of certain types of industries in the Paraiba valley. There is legislation to this effect which is implemented in the three states, but each has laws adapted to its peculiar conditions, which prevents the achievement of uniformity.

The Paraiba River has the most complex basin in Brazil in terms of pollution. Short-range solutions are adopted, such as the treatment of industrial wastes, the establishment of fines and inspections, but the technicians believe that the only effective solution must be a long-range one, through the education and enlightenment of the population along the river banks. As strictly speaking there is no tool for detecting pollution which can replace observation by man, "the ideal thing would be for the people to report on all the changes they see in the water, a common practice in England," Ricardo Silveira said.

"This would be extremely useful. A plan for collecting information through the CEDAE [State Water Company], the highway police, the prefectures and other bodies, for example, could be organized, since there are no chemical or physical sensors anywhere in the world which can measure the changes in rivers (this is why biological tests using fish and bacteria are carried out). Work of this sort with the people would be of great specific value and would function further in terms of motivation."

The Lagoons

Ricardo Silveira believes that "every lagoon has a tendency to become marshy or something similar."

"This is a natural phenomenon, but the actions of man can speed up this process of change. This is what is happening with the Feia, Araruama and Marica Lagoons. The lagoons are being used rather than managed, which would be proper. There is no natural development, with the utilization of the soil in the region in mind. A lagoon such as Feia should extend over a much larger area than it currently does. But the natural inclination of people with land near it is to contain the water in some way and to increase the area they own.

"This should not be done on the basis of the judgment of the basis of each individual, in delimiting and developing these areas," the engineer added. "The DNOS [National Department of Works and Sanitation] has taken a whole series of steps with regard to Feia Lagoon: it has cleared the basin, which was an unhealthy region, has drained this area for farm use and built canals, and built various links between the lagoon and the Paraiba River, so that it can function as a shock absorber for floods--in other words, when there is too much water in the river, the lagoon absorbs it.

"The projects which the DNOS has carried out in the region for the purposes of regulation, drainage and irrigation are altering the regime of the lagoon to the point that it is reaching a new state of balance. The lagoon will not die, but it is certain that the shallower areas will cease to be part of it, not only because of the project, but also the activities of the neighboring farmers, who will recover the area for planting. It is the duty of the government to regulate this before the problem becomes more serious. The difficulty with any environmental problem--and this is a serious one--is the definition of environmental use, because it involves technical, political and social aspects."

Bagasse

According to Ricardo Silveira, bagasse (the residue from alcohol distillation) is one of the substances with the highest pollution potential, measured in terms of the organic material it contains.

Bagasse is related to the production of alcohol. Without bagasse there can be no alcohol. What can be done is to reduce the volume of bagasse. The residue from the production of a liter of alcohol is 11 liters of bagasse, and alcohol production in the northern part of the state of Rio de Janeiro currently is running about 150 million liters per year (the PROALCOOL [National Alcohol Program] goal is 1 billion liters from the region by 1985). The bagasse is about 40 times as concentrated as domestic sewage. In terms of organic matter, 1 liter is the equivalent of 50 liters of sewage.

According to Ricardo Silveira, "the bagasse-alcohol ratio could be reduced by half. Modern techniques make it possible to ferment in such a way as to have 6 liters of bagasse for each 1 of alcohol instead of the present 11."

"There is a potential for the industrial use of the bagasse itself:
1--To produce biomass, i.e. leaven or fungus for use as fodder, since there is a rich protein content. I believe that in the future man will make use of this fungus as food, because of the high protein content. But already today it can be used as protein-rich fodder for cattle. 2--Bagasse has 2 percent degradable sugar, of which 1.2 percent is pentose and the balance residual sugar. This sugar could be utilized to produce animal feed, with the rest being used in some other process. 3--Another possibility is the concentration of bagasse, which could be used to balance animal rations. 4--Bagasse can also be used to produce methane gas, supplying an entire plant and solving energy problems. 5--Bagasse, which has organic material which burns, can also be incinerated. 6--Mixing bagasse into the soil is also a means of utilizing it, but it depends on the type of soil and the organic materials found therein. Unfortunately, the soil in the Campos region does not lend itself to this use."

Silting of Lagoons in the Coastal Lowlands

According to the PRENAT survey, the Coastal Lowlands region suffers from "the impact of spontaneous occupation as a result of tourist undertakings in many cases characterized by heavy real estate speculation." "The large number of persons moving into this region in the summer holiday season," the technicians add, "still further aggravates the lack of basic infrastructures. Some specific problems are causing critical situations in the area, such as the washing of dirt into the lagoons, the obstruction of the communicating canals and permanent silting. These problems are causing a decline in fishing activity threatening the very survival of a traditional community of fishermen."

"In the Coastal Lowlands," Ricardo Silveira said, the complex of results of the development of the Macae oil chemical center should be carefully studied, "not only because of the potential industrial pollution, but mainly as a function of the prospects for population increase."

Industrial Wastes Along the Middle Paraiba

"Environmental deterioration in the Middle Paraiba Industrial Zone, "the PRENAT document says, "is a result not only of the economic exploitation throughout many years, but also the more recent settlement processes which have affected it. Its location between the largest production and consumption centers in the country and the possibility of rapid transportation of production via the railroad and the Dutra highway, in addition to the abundance of water, availability of energy and nearness of the main maritime ports of the country have led to its economic development based on industrial activities."

Poor management of the soil and generalized deforestation of the region have left the area of natural pastureland reduced.

"In this region," the technicians add, "various environmental problems are found. In terms of importance, the main problem is that of the Paraiba River, the main source of the water and energy supply for the state. It has a direct or indirect influence on the lives of about 9 million persons, representing more than 80 percent of the population of the state. There are almost 700 industrial installations along its banks, more than 200 of them in the state of Rio. The industry dumps the most widely varied materials into the Paraiba, liquid and solid residues of various compositions, including a number of non-biodegradable substances, as well as others which are highly toxic. To aggravate this problem, innumerable urban centers without sewage systems lie along the length of the valley. In many cities in the state, the dumping of natural wastes comes to 36 tons per day."

"There are other problems to be found in the Paraiba valley, such as accelerated erosion as a result of earlier deforestation. There are also critical situations having to do with urban industrial expansion in an area crowded among the hills and with little space which can be used for construction."

Deforestation and Erosion in the Mountains

According to the PRENAT document, "the deforestation of the Mountain region, which has been very intense, is becoming a threat to the area itself and also the metropolitan region, because the water resources serving the population of the urban centers have their origins in the mountains.

"The erosion and the cave-ins caused by construction projects are even affecting the main transportation axes, as is the case with the routes linking Rio with Friburgo and Petropolis. Real estate speculation is to be found in a number of municipalities, where one badly planned subdivision follows another, many of them located on steep slopes which should be preserved. Better regulation of settlement on the land is necessary."

Mangrove Areas on Southern Coast Threatened

"The material which the tides wash up in Angra dos Reis," says engineer Ricardo Silveira, "not only enriches the mangrove swamps with nutritive particles, but also keeps the bay water clean. We can see that the water at Angra is very clean. What can cause it to become dirtier is the material which results from the building of the new road. But a disaster could happen in Angra--the removel of the mangroves, since the land on which they grow is cheap and could become the focus of real estate speculation."

"The ideal thing," he says, "would be not to have settlements in any mangrove areas. But there are problems and subdivision processes and a compromise must be struck. However the majority of the mangrove swamps should not be settled. The government should work through the SEMA to make owners aware that settlements should not be allowed on mangrove areas."

According to Ricardo Silveira, the region where the mangrove swamps are might be included in a tourist plan, "but it should all be done within the framework of a political decision, and a technician cannot make this decision, because he does not have the authority on this level.

"The mangrove swamp cannot be replaced by anything else in its role as a breeding area. The living areas in Guanabara Bay, for example, could be utilized despite the depredation of the surrounding areas. The bay could be repopulated with fish to the extent that the quality of the water is improved. For this reason it is foolhardy to think of filling in that mangrove swamp.

"When it comes to the implications of building nuclear plants in Angra," engineer Ricardo Silveira said, "we can divide the problem into two parts: the nuclear energy in Angra and the radioactive contamination of the environment. Concerning radioactivity, the precautions taken by nuclear plants are much stricter than in any other type of industry, and the water coming out of the plant is not contaminated. There remains accident control, a phenomenon found all over the world. As to the suitability of the location, we do not have access to the criteria for the choice of the area. The water used at the plant will be discharged at 7° above normal temperature at a rate of 160 cubic meters per second, which is a very heavy rate of flow. Thus the inlet will receive warmer water. This will cause changes in the region.

"When I speak of changes," the engineer explained, "I mean those that are inherent in the presence of man. This can cause alterations in the bodies which live there in balance, habituated to that temperature. When the temperature is raised these organisms will lose out in the competition to others accustomed to higher temperatures. There will not necessarily be a change for the worse. There will however be changes. I believe that this region will see some alterations, but nothing catastrophic. If this temperature level is maintained the situation will be under control."

Bay Problem in Metropolitan Region

Ricardo Silveira said that there is a slum recovery project for the metropolitan region seeking to make use of what is already in existence and on this basis, seeking suitable solutions to the problems, mainly where environmental questions are concerned--water, sewage and garbage.

"It is not a question of managing these problems, since each sector has a responsible body (COMLURB, CEDAE). Rather we will try to benefit the people through solutions we will seek and develop. What we have done is to develop our work through the population infrastructure.

"Industrial pollution in the metropolitan region is the result of heavy industry in a number of urban quarters. Like any great city or megalopolis, there is coexistence of industry and the population, which is serious. The problem of air pollution is serious. But there is a double cause: the presence of industry and the growth of the city. Industry is not solely to blame. The population, due to urban growth which was not planned, is moving in on industry and in the final analysis suffers the consequences of pollution."

Guanabara Bay

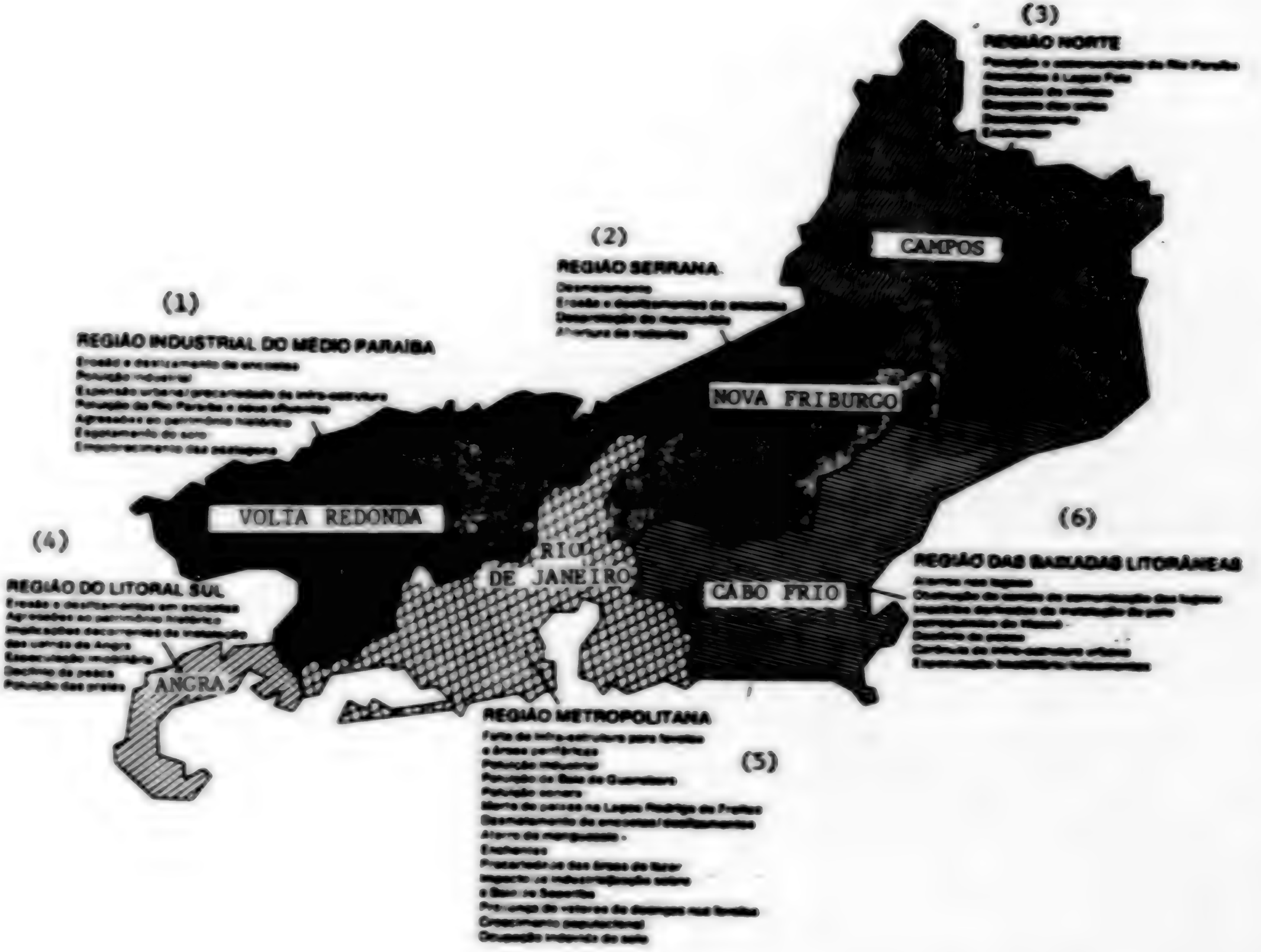
Ricardo Silveira does not believe that Guanabara Bay is dying, "as many people say."

"It is not known, for example, if the fishing in the bay is predatory. In terms of solutions for the bay, we will first analyze the pollution problem. The truth is that there are sectors which are greatly threatened, mainly in the region of the Porto and Cajo wharves, and in Niteroi, the sardine industry region. With the exception of this and the beaches at Ramos, Flamengo and Botafogo and the submarine dispatch area, the bay situation is not so desperate. But it might be more or less so depending on what we want of it. Is it a port? Is it an area for maritime sports? What purpose does Guanabara serve? It is on this basis that we will study the problem. The FEEMA can suggest solutions for each case." According to this engineer, there is not a single, standard solution for Guanabara Bay but "there is a whole series of alternatives with given costs."

Noise Abatement

"Noise pollution," Ricardo Silveira said, "is what bothers people most. The Paraiba River contains pesticides and the people drink the water, but this is not so irritating as the clamor. Both where noise pollution and air pollution are concerned, the greatest contributing factor is the car. Unfortunately we are not equipped to resolve this problem. There is no body responsible for the noise level. The municipality, the state and the federal government are all responsible. This field is not clearly defined and as a result we do not have tools with which to deal with this type of pollution.

"But the most serious thing," the engineer concluded, "is the noise of the machinery scattered throughout the streets of Rio. And the public authorities have tools for preventing or limiting this, that is for reducing the decibel level at least to more acceptable standards. Rio is a very noisy city. And as we said, the problem could be ameliorated somewhat to the extent that there is better control of the decibel level by the government."


(3)
REGIÃO NORTE
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REGIÃO INDUSTRIAL DO MÉDIO PARAÍBA
NOVA FRIBURGO
VOLTA REDONDA
(6)
REGIÃO DAS BAIXADAS LITORÂNEAS
(4)
RIO DE JANEIRO
REGIÃO DO LITORAL SUL
CABO FRIO
ANGRA
REGIÃO METROPOLITANA
(5)

Key to map:

1. Middle Paraiba Industrial Zone.

   Erosion and slippage on slopes
   Industrial pollution
   Urban expansion--precarious infrastructure
   Pollution of the Paraiba River and its tributaries
   Destruction of historical heritage
   Exhaustion of the soil
   Impoverishment of pastureland

2. Mountain Region

   Deforestation
   Erosion and slippage on slopes
   Failure to protect water sources
   Building of roads

3. North Region

   Pollution and silting of the Paraiba River
   Incursions upon Feia Lagoon
   Dumping of bagasse
   Soil erosion
   Deforestation
   Flooding

4. South Coastal Region

   Erosion and slippage on slopes
   Destruction of historical heritage
   Consequences of the building of the Angra plants
   Real estate speculation
   Decline in fishing
   Pollution of beaches

5. Metropolitan Region

   Lack of infrastructure for slums and peripheral regions
   Industrial pollution
   Pollution of Guanabara Bay
   Noise pollution
   Death of fish in Rodrigo de Freitas Lagoon
   Deforestation and erosion on slopes
   Silting of mangrove swamps
   Floods
   Threats to vacation areas
   Impact of industrialization on Sepetiba Bay
   Presence of disease vectors in slums
   Population growth
   Improper use of the soil

6. Coastal Lowlands Region

Silting of lagoons
Blocking of canals linking lagoons
Impact of the development of the Macae petrochemical center
Decline in fishing
Lack of urban infrastructure
Real estate speculation--subdivisions

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BRAZIL

RIO GRANDE DO SUL OUTLAWS PESTICIDES CONTAINING MERCURY

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 3 May 80 p 12

[Text] Porto Alegre--The governor of Rio Grande do Sul, Amaral de Souza, sent a communication yesterday to Minister of Agriculture Amaury Stabile asking for "energetic" measures to put an immediate halt to the sale and use of pesticides including mercurial elements, "in view of the evidence of poisoning of tomato production in various regions of the state caused by the incorrect and illegal use" of these chemical products, "placing the health of the population of Rio Grande do Sul at serious risk."

"Such a prohibition," the governor wrote, "would be the only way of solving the problem of contamination without causing further damage, since these pesticides are used in this state only in the cultivation of vegetable crops." He said further that "this measure, if adopted, will benefit the health of the population and will contribute substantially to protecting the environment, since the capacity of mercury to endure in the soil and the water is known."

On the other hand, the Rio Grande do Sul government will begin to require quality certification guaranteeing that tomatoes coming from other states are free of mercury, according to a decision made yesterday by the secretariat of health and the environment, on the basis of a recommendation from the state pesticides group which met all day to analyze mercury contamination reported for products sold in Porto Alegre. At the same time, the inspectors of this secretariat and the Ministry of Agriculture began to seize stocks of mercurial fungicides which have been used improperly, since although they should only be used on seeds, some farmers have been applying them to the fruit of the tomato plants.

After confirming that the tomatoes sold in the capital of Rio Grande do Sul contained mercury in excess of the "nationally and internationally" accepted limits, as Dr Moacyr Scliar, director of the secretariat of public health, stated, sales of the product by the CEASA [State Supply Center, Inc], the main distributor, dropped by 90 percent. Scliar reported that 4 major producers in the Porto Alegre region, accounting for 40 percent of the production, were given a release to sell the products of their fields after laboratory tests were made of the tomatoes. Eleven other producers are still prohibited from selling because the samples are still being tested.

The president of the state pesticides group, Carlos Roberto Foschera, said that it is the responsibility of the retailers to demand quality certification, based on the inspection of health and agriculture authorities, who will "prohibit shipments from other states in which mercury has been found."

The government technicians will continue to inspect the plantings in greater Porto Alegre and will prohibit the use of the products of those where mercury has been improperly used. As to the tomatoes already on the market, the health secretariat recommends that they not be used, or if they are, that they be peeled "which will eliminate a high percentage of the mercury," according to Moacy Scliar.

Apart from seizing the stocks of mercurial fungicides presently on the market--a Ministry of Agriculture regulation says that they can only be used by the manufacturers--the Rio Grande do Sul authorities are issuing appeals to the farmers by radio and newspaper asking them to return their supplies to the cooperatives or stores where they bought them. "This is a means of avoiding further damage to the environment," Scliar explained. "A farmer might, fearing punishment, throw the products into a creek or dam reservoir."

Tomato paste is also being examined for evidence of mercury, but no reports have yet been released. According to Irani Zolim, director of the foods division of the health secretariat, "theoretically, if tomatoes are contaminated, tomato paste will be much more so, because it takes 5 kilograms of tomatoes to produce 1 of tomato paste."

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MEXICO CITY: 'WORST ENVIRONMENT IN THE WORLD'

Mexico City EXCELSIOR in Spanish 8, 9, 10 Apr 80

[Three-part article by Gilberto de Estraubau]

[8 Apr 80, pp 1-A, 13-A, 14-A, 16-A]

[Text] The Federal District's Environment Is World's Most Deteriorated

On 4 October 1976, 10 children in the town of Lecheria in the state of Mexico died from contact with substances emanating from the "Chromates of Mexico" plant. At that moment, it was also discovered that the "yellow dust" discharged by the plant was causing hemorrhages and skin ulcerations in another 500 infants, destroying the fresh water pipelines serving the population and perforating the nasal walls of the plant's workers. Chromates was obliged to close, but it left behind a large quantity of residues estimated at 100,000 tons, which are still poisoning the atmosphere at this moment.

On 20 February 1979, a cloud of greenish-yellow gas blanketed Teoloyucan, a town of 35,000 which is also located in the state of Mexico. The gas had escaped from a plant known as "Ciclomeros" and upon dispersal, caused 35 deaths and 200 million pesos worth of crop losses.

The above cases are examples of how pollution kills almost 100,000 Mexicans every year. It undermines the rest of the population with illnesses ranging from leukemia and cerebral hemorrhages to chronic dysentery, conjunctivitis, bronchitis and pharyngitis.

What is being done to neutralize this mortal danger that threatens us all? Pathetically little, to judge from the statements of medical authorities, university researchers, the presidency of the Mexican Ecological Law Society, the United Nations, legislators, officials of the Secretariat of Health and the Department of the Federal District. Even the foreign press has already begun to pay attention to and comment on the ecological situation in Mexico.

What is Pollution?

According to Ramon Ojeda Mestre, president of the Mexican Academy of Ecological Law, "pollution is the presence of factors that alter the health and development of living species, caused principally by the processes of industrialization. A condition that is alien and injurious to human life.

Pollution occurs in various areas: air, water, sound and food being among the principal ones.

With respect to atmospheric pollution, according to data from the Undersecretariat for Environmental Improvement, there are 787,441 commercial and industrial establishments in this country that are polluting. In the Valley of Mexico, specifically, nearly 3 million people also defecate outdoors every day, producing 375 tons of pollutants that form solid waste in the environment.

As will be seen further on in this article, the authorities blame the pollution on the industrialists, the industrialists blame it on drivers of cars and trucks and the car and truck drivers still have not found anyone to blame. One way or another, it is evident that automotive vehicles are a significant factor in the deterioration of the environment. Figures supplied by accountant Carlos Marquez, director of the Federal Automotive Registration Bureau, show that there are 1.5 million automobiles presently being operated in the Federal District, along with 500,000 vans, pickups, buses and trucks. Added to this, we have vehicles from neighboring areas, mainly real estate developments in the state of Mexico, which have been impossible to evaluate as yet. The total number of vehicles in the country is 5.3 million. There are 3.6 million automobiles and 1.7 million vehicles of other kinds. Every day nearly 1,000 vehicles are added to the capital traffic.

The sum total of all these factors--131,000 industries, approximately 3 million vehicles, 350 tons of waste and 7,000 tons of garbage a day--are making greater Mexico City perhaps the most polluted human settlement in the world. For now, according to measurements made by engineer Fernando Ortiz Monasterio, head of the "Man and His Environment" department at the Autonomous Metropolitan University, depending on the climatological conditions, Mexico City sometimes even exceeds 15 times the maximum allowable levels of pollutant concentrations, according to UN standards set by the World Health Organization and the UN Program for the Environment (PNUMA).

Water Pollution

The documentation published by the Undersecretariat for Environmental improvement notes that petroleum is the principal pollutant, followed by chemical and metallurgical industries and paper, cement and stone processing plants.

The most dramatic cases of water pollution are occurring at this moment in the Gulf of Campeche, the Lerma River and the Tula area, in the states of Mexico, Veracruz and Jalisco.

According to statements from Mexican Petroleum, as of this moment, the Ixtoc well has spilled 43.1 million barrels of oil into the Gulf of Campeche.

(One barrel is equal to 159 liters.) So far, it has been impossible to evaluate the ecological damage that the spill has caused or will cause.

The Lerma River (EXCELSIOR, 17 February) "has become a stream of pollution. The only thing it carries is the water from the industrial wastes of the Toluca Valley industrial zone."

Nonetheless, this river supplies 16 cubic meters of water per second for consumption in the Federal District.

The lagoons of Almoloya de Alquiciras and San Mateo Atenco have already dried up. Some 500,000 peasants have been left without water for home consumption and agricultural use. The water table, originally close to the surface, first dropped to 20 meters and is now at 70 meters.

Tula is on the verge of being declared an ecological disaster zone. The flora and fauna have disappeared. Local deputies agree in pointing the finger of blame at the Miguel Hidalgo refinery and the Francisco Perez Rios steam-electric power plant as the ones principally responsible for the crisis, but especially to the excessive drainage from Mexico City, which is discharged into the Endo reservoir.

According to the "Ecoplan" for the entity prepared by the Urban Ecology Bureau of the Secretariat of Human Settlements and Public Works, the most polluted rivers in the country are in Veracruz. "Because of the irrational use of resources and the dumping of pollutants into the environment, the elements of nature have been altered," says the letter of the text.

Finally, Jorge Zambrano, head of the Jalisco Association of Communal Land and Fishing Organizations, has stated that fish from the lakes of Chapala and Castilan and from the La Vega reservoir are doomed to death from chemical residues discharged by industries along the banks of those bodies of water which use no anti-pollution devices or techniques.

Noise Also Pollutes

Due to Christmas and Easter holidays, staggered vacations and similar activities, engineer Humberto Romero Perez, assistant secretary of Environmental Improvement, found it impossible to meet with this reporter. Despite this, we were able to learn that, immediately after its creation, that agency succeeded in uncovering 13,000 sources of noise in Mexico City.

Data supplied by the Federal District's Center for Acoustical Studies also indicate that the noise level in the capital doubles every three years.

According to that same source, Mexico City is the third noisiest city in the world. The first is Los Angeles and the second, Tokyo.

Finally, the Center for Acoustical Studies noted that 87 percent of the capital noise is caused by urban passenger buses.

One of the programs of the Undersecretariat for Environmental Improvement is to research chemical and biological contamination of foodstuffs.

As a result of that program, 4 heavy metals, 10 pesticides, 4 kinds of fungus or aflatoxins, 5 microbiological groups or agents and 4 parasites were discovered as contaminants in 50 foods chosen for their importance to human consumption.

"So far, budget limitations and lack of support for the laboratory have permitted us just to begin our activities in the Federal District, which represents 20 percent of the nation's population," states a document from the General Administration of Research on Effects of the Environment on Health, of the SSA [Secretariat of Health and Welfare].

Comments of Persons Concerned

Interviewed at the memorial ceremony in honor of Jose Maria Pino Suarez last 21 February, Carlos Hank Gonzalez insisted that electric mass transit will multiply in the city because officials are seeking to lower the noise level in the capital, "since it is already intolerable." The same thing is true with air pollution, "whose levels already exceed limits dangerous to the health of residents."

However, speaking with Federal District legislators five days later, Hank Gonzalez ranked pollution last among the seven basic problems facing the city, after demographic growth, pure water, roads, safety, education and solid waste disposal.

That same day, 22 February, engineer Enrique Tolivia, director of Atmospheric Cleanup, said that 2,800 industries built in the Valley of Mexico were considered to be "highly dangerous" because they handle toxic substances. Several of these industries produce hoses and plastic articles made of vinyl chloride, a substance that "causes cancer, as has been proved in the United States."

Because of these statements by Tolivia, Juan Jose Garibay, president of the State of Mexico Industrialists Association, said that a witch hunt was being generated against companies that pollute the environment. He insisted that "millions of pesos" (he did not say how many) have been invested to comply with the established standards. Also, added Garibay, the greatest problem with pollution is not caused by industries, but by automobiles, which are responsible for 80 percent of the deterioration of the environment.

(With regard to carcinogens, we have an ominous "tie score" here. Although vinyl chloride and other raw materials cause cancer, Charles B. Higgins, University of Chicago professor and winner of the Nobel Prize for Medicine, has isolated the hydrocarbon "TMBA," which is found in gases released from the combustion of automobiles and cigarette smoke and which has been shown in the laboratory to cause leukemia.)

London and Pollution

London is a metropolis that is especially sensitive to the problems of pollution. A few years ago, the problem there was so serious that an emergency plan had to be instituted to prevent the deaths that had begun to be caused by pollutants emanating from cars and factories.

Writing in THE OBSERVER early this year, Philip Hodson says:

"A governmental branch needs a lot of courage to reveal, as the Undersecretariat of Environmental Improvement did recently, that pollution increased 50 percent in this capital during 1979...and that it was expected to increase notably. The atmospheric pollution is composed of 31 parts per million of sulphur dioxide; 43 parts dust or particulate pollution and 72 parts per million of carbon monoxide."

The place is Mexico City, and the circumstances are the irritated throats and teary eyes of its residents.

If pollution in Los Angeles reached levels similar to those of this city, the authorities would quickly order two things: legal restriction of automotive traffic and the imposition of harsh measures to prevent pollutants in industry and in the manufacture of vehicles. But in this city, everyone does his own thing: each one inhales as much smog as possible all by himself.

A total of 120 Patrols, 90,000 Kilometers

Not all the authorities are so indifferent to pollution as THE OBSERVER would have one suppose.

For example, the General Directorate of Police and Transit (DGPYT), has 120 patrols to detain vehicles that are polluting in an area of 90,000 square kilometers of city streets.

Arithmetically: one patrol to control 17,000 cars a day and an area of 7,500 square kilometers.

Col Mario Mena Hurtado, the DGPYT's road director, stated that, despite the limitations, the environmental cleanup squads are showing good results. From January to the present, 19,111 polluting vehicles have been detained. In 1979, more than 200,000 were stopped.

The Anti-pollution Center for gasoline-powered vehicles is on Reforma and Comonfort. There is another pollution inspection and diagnostic center on Cuemanco, specializing in diesel-powered buses and trucks. Another 15 centers are under construction in each of the local offices of the DDF.

Mena Hurtado explains that when a squad discovers a vehicle that is polluting, it stops it and draws up a formal statement giving the driver 30 days to eliminate the defect. If the driver complies with the agreement, he is not fined, but if he ignores it, a fine is levied and his license is suspended. He may get it back when he shows that his vehicle is no longer polluting.

The Anti-pollution squad also makes periodic inspections of passenger and freight terminals and commercial and industrial firms that maintain fleets of vehicles.

Radioactive Contamination

With all of this, plus the terrible situation produced just by conventional pollutants alone, we have not yet added the possibility of contamination by atomic residues, given Mexico's entrance into the nuclear power age with plants such as the one at Laguna Verde.

This possibility is so real that in the United States, where there are 100 commercial reactors, no insurance company has accepted the risk of protecting the power plants with insurance against accidents or injury to third parties.

Regarding the possibility of contamination by radioactivity, all of the studies done to date (United States Atomic Energy Commission, the University of Pennsylvania and the University of Michigan) recognize the risk of a major accident at any time.

An accident in a reactor such as the one at Laguna Verde would cause 27,000 deaths, 73,000 injuries and 374,000 million pesos worth of material losses, according to the University of Michigan.

On the other hand, specialists agree that no solution has been found to handle the radioactive poisoned wastes. And let us remember that one kilogram of plutonium--the substance into which uranium is converted after being used as a fuel in reactors such as Laguna Verde--produces 20 billion radioactive particles, each one capable of causing lung cancer. These particles require 24,000 years to lose half of their radioactive charge.

Finally, specialists agree that it has been impossible to provide effective protection against attempts against nuclear plants or fuel, or against accidents during the transporting of the fuel. Furthermore, and this is of special interest to Mexico, the problem of the nuclear plants' vulnerability to earthquakes has not been solved either.

[9 Apr 80, pp 1-A, 14-A]

[Interview with Ramon Ojeda Mestre, president of the Mexican Academy of Ecological Law; date and place not given]

[Text] O. Mestre: "Foolish and Complex-ridden" Use by Mexicans of Their Automobiles

Ramon Ojeda Mestre, president of the Mexican Academy of Ecological Law, said yesterday that Mexico suffers from "grave ecological illiteracy," and accused the transnational companies, individuals, groups, firms and public entities of polluting "mercilessly."

Ojeda Mestre also pointed out that a great number of deaths are due to the "foolish and complex-ridden" use by Mexicans of their automobiles and to the terrible degree of uncivilized behavior from which we suffer.

Speaking on the causes of pollution in Mexico, Ojeda Mestre said, "In the first place, there are the urban, family, commercial and industrial discharges which go into the river currents. At this moment, the rivers are the focal points of pollution. It is not that they cause pollution in themselves, but that large amounts of pollutants are dumped into them.

Secondly, we find vehicles that give off smoke, liquid gases, noise and heat, etcetera.

Thirdly, there is what we could call the "solid waste lifestyle." What I believe is inadequately called the throwaway culture, but which in actuality is a process that occurs only among certain groups.

[Question] Where do you rank factories as polluters?

[Answer] Within this scheme, factories would be in last place.

People Matter, Not Pollutants

Ojeda Mestre founded the Mexican Academy of Ecological Law early in 1975, along with 200 other specialists in law and related disciplines. The Academy arose as "a body to disseminate information about environmental problems and possible solutions," because its founders felt that "at the end of the past six year period, there was not enough communication between the public sector and the people."

[Question] How many kinds of pollution exist?

[Answer] Pollution is defined according to its importance to the thing affected. Thus, it can be related to soil, air, water or the environment in general...it can be from diverse categories.

But trying to classify it leads to deception, which distracts us from the real problem. What should worry us, over and above the merely scientific or statistical, is the human being, who suffers the deterioration of his health, his life and his intelligence.

The "ecological form" that affects us is not important, whether it be smoke, gas, dust or burning tires. We should not even be concerned about who is causing the pollution, but rather about who is suffering from it. For instance, those who suffer most from pollution are the children. We have 12 million children in Mexico, so there are 12 million people who are suffering, and all the classifications by the technical experts and their statements to the effect that this or the other aspect of pollution has been controlled don't matter.

What matters to us is the uncontrolled pollution. It is the obligation of the technical experts, scientists and the politicians themselves to tell us what pollution is uncontrolled. Because the uncontrolled pollution is what has caused illnesses in the respiratory tracts and gastrointestinal systems of 12 million children.

[Question] Your insistence on speaking of uncontrolled pollution--is that what makes the undersecretary of Environmental Improvement call you "catastrophists"?

[Answer] That is precisely why engineer Humberto Romero Alvarez calls us "catastrophists," because we stress the negative points and de-emphasize the positive ones. But we are not talking about engineer Romero Alvarez. He does what he can with the meager budget he handles.

The Problem of the Automobile

At a United Nations seminar on the environment recently it was said that we were condemned to pollution in Mexico because 40 percent of the nation's industrial workers are concerned with producing parts for the automotive industry, and making fewer automobiles would be condemning a large sector of the population to unemployment. What do you think about this?

[Answer] We have reached a point in Mexico where the automobile has become an enemy of social healt There is no solution other than to prohibit, limit and regulate the use of automobiles.

[Question] But mass transit systems are not enough.

[Answer] Obviously we must create these systems. If we know that the focal point of pollution "par excellence" is the automobile, we must curb it. We have to expand the Metro, the trolleys, bicycles and pedestrianism.

[Question] At the United Nations seminar it was also mentioned that Venezuela--the country with the largest per capita income in Latin America--had prohibited the manufacture of cars larger than six cylinders. The foreign experts asserted that it was "monstrous" that enormous cars are still being built in Mexico when they are being discarded in other countries. Do you agree?

[Answer] There is no doubt that the manufacture of big cars should be prohibited in Mexico, but I feel that there is a fallacy in the posing of this problem because it would limit the dispute to the number of cylinders. There is a fallacy here because automobiles grow old. Mexico is not a country that throws its cars on the junk pile after two years of use. Here we use them for at least 10 years. And a 1980 eight-cylinder model pollutes less than a 1970 four-cylinder model. So we should not prohibit the manufacture of eight-cylinder cars, we should prohibit the manufacture of cars in general.

[Question] And what about the industry? And the jobs?

[Answer] The industries can reconvert. For example, let them manufacture tractors, which are so badly needed.

Supermarket Bags

[Question] Sir, do you agree with the assertion that "poverty is the great polluter"?

[Answer] Pollution is a product of lack of culture and lack of foresight. It is not a product of poverty, for if this were so, the rich and highly developed countries would not be producing pollution. Poverty alone does not cause pollution. Wealth also causes it, and to a very conspicuous degree.

[Question] From the standpoint of pollution, does the use of nuclear power plants such as the one at Laguna Verde imply a real risk?

[Answer] It implies exactly the same risk as it does for countries such as the United States, the Soviet Union, France and China. But these are risks of development, risks that we should and must take. What we cannot take are unnecessary, senseless risks. We must be alert, for many countries would like to see us become a veritable garden, an ecological paradise without pollution, but without progress.

If we consider nuclear energy dangerous, we must experiment with solar and wind energies, ocean tides, biomass and thermal energy. These are "free" energies. They do not pollute.

The dumping of industrial wastes into rivers, the use of plastic bags in supermarkets--these are the prices we don't need to pay. This kind of thing is foolish. We are already beyond that. But the risks of producing energy, of producing oil, those risks we must run, for no one wants us to remain an underdeveloped country forever.

[Question] It is claimed that with Mexico--and with the undeveloped countries in general--imperialism always wins twice. First it sells them technology and industrial equipment that pollutes and then it sells them anti-pollution equipment and technology. Is that true?
[Answer] I do not believe that "imperialism" is a useful term to define any ecological situation. All countries pollute--socialist and capitalist. Only the kinds of pollution change.

[Question] According to the data you have, is Mexico presently in an ecological crisis?

[Answer] We are undergoing an economic and cultural crisis that presages an ecological crisis.

[Question] Do deaths occur from environmental pollution in Mexico?

[Answer] Yes. Between 97,000 and 100,000 a year.

[Question] Would you point to the General Directorate of Police and Transit as the principal agency responsible for the pollution in Mexico City?

One of Those Responsible

[Answer] Obviously. Who is in charge of streets and traffic? If they know that in order to maintain an average circulation of 27 kilometers per hour, only a certain number of automobiles can be allowed to enter, let them close off the city and that's it.

And if drivers who are refused admittance are angry? Let them be angry. We are trying to solve a problem, not to be pleasant.

The DGPYT is not the only one to blame. The whole city government is to blame. We must establish order in the city. Social interests come before any other kinds of interests. If the people who defecate outdoors are polluting, we know where they are. We must install bathrooms for them, whatever the cost, and stop planting flowers along the Reforma. Mexico is still a poor country and it should live like a poor country.

And what about garbage? The city covers an area of 1,499 square kilometers and produces 7,000 tons of garbage a day. We know that garbage processing plants cost a lot of money and we cannot afford them. But we have trucks. A truck costs 400,000 pesos. There is no reason to leave garbage in the city. Let it be collected at night, loaded in trucks and taken along the least traveled highways, 80 kilometers from the city, to create sanitary landfills and fertilize El Mezquital or Tlaxcala. For leaving garbage here in Meyehualco or Santa Fe--in places with a population density of 20,000 inhabitants per square kilometer--is plainly and simply a crime.

[Question] What other kinds of solutions would you suggest for pollution in Mexico City?

[Answer] Limiting the circulation of vehicles, definitely. By days, by odd and even numbered license plates, by the sale of gasoline. And by organizing traffic patterns. Traffic congestion has nothing to do with the public or with the automobile in itself. It is the lack of judgment of the police, frankly.

[10 Apr 80, pp 1-A, 18-A]

[Interview with Eng Fernando Ortiz Monasterio, chief of the Autonomous Metropolitan University's "Man and His Environment" department; date and place not given]

[Text] Law Does Not Cover Gas Pollution

Eng Fernando Ortiz Monasterio, chief of the Autonomous Metropolitan University's "Man and His Environment" department, said that in Mexico it is legal to pollute with the emission of gases because the law covers only the control of smoke, dust, water and noise pollution.

The specialist asserted that the industrialists of the Toluca Valley produce 95 percent of the pollution in the area and that they have turned the Lerma River into "the biggest sewer in the country." Ortiz Monasterio also said that Mexico has the unhappy distinction of being the country that has caused the greatest oil pollution in the whole history of humanity.

"Mexico is second among nations with regard to the number of trans-national firms, and these companies are using our country to manufacture their most polluting products, the ones they are not allowed to manufacture in their places of origin."

"Regarding our industry," he added, "if we want to compete world-wide, we will have to continue to pollute, because the cost of anti-pollution technology is very high and to incorporate it would price us out of the market. For that reason, a law has been created that does not prevent pollution but justifies it."

Federal District and

[Question] Engineer, you assert that the pollution in the Federal District "sometimes" is 15 times the maximum limits accepted by the World Health Organization. Does this mean that pollution emissions vary?

[Answer] The emissions are are practically constant. The concentration depends on climatological factors: wind, temperature, etcetera.

The situation is worst when it is hot, because this causes a thermal inversion--a layer of heat that encloses the valley like the stopper on a bottle. This invisible layer of heat prevents the polluting gases from leaving the atmosphere.

[Question] What measures could be taken to reduce pollution to acceptable limits?

[Answer] Something could be done with the automobiles, but with industrial pollution there is nothing to be done?

[Question] Why?

[Answer] Because the anti-pollution law has been created to legitimize pollution. Private enterprises, Pemex, any industry that pollutes takes out the law and shows that it is observing allowed limits and the percentages established by the technical experts.

But those percentages are monstruous. And there are criminal omissions. For example, at no time does the law deal with the emission of toxic gases. It mentions exclusively dust, smoke, water and noise pollutants. As far as it is concerned, gases do not exist. However, some of the most lethal substances, such as chlorine and fluorine, are gases at the surrounding temperature, and they are used tremendously in industry.

[Question] Besides the Federal District, what other areas of the Republic have such a deteriorated environment?

[Answer] We could point out several, but I believe that the Gulf of Campeche and the Gulf of California currently are ecological disaster zones. In Campeche, we have the Ixtoc oil spill, and in the Gulf of California, we have the results of the phosphates and nitrates from fertilizers that are used in the Yaqui and Mayo valleys and which drain into the Gulf. This is causing irreversible mutations among various marine species and some of them are disappearing altogether.

Sugar Refineries Principal Polluters

Dr Jorge Carranza Fraser, general director of the National Fishing Institute, asserted that all the Mexican bays and rivers are "heavily polluted."

In the bays, he noted, the principal and "most spectacular" pollution is organic and consumes the oxygen and kills the fish. In the rivers, principally in the state of Veracruz, the greatest polluters are the sugar refineries, he added.

"We cannot block off the sun with one finger. There is heavy pollution in the Gulf, in our bays--Ensenada, Guaymas, Acapulco, Veracruz--and in the lower part of the Coatzacoalcos River. No one can deny it, not Pemex, not anyone."

Carranza Fraser explained that Mexico has 200,000 hectares of interior waters and 1,050,000 hectares of coastal lagoons. The latter bodies of water are of vital importance because shrimp, oysters, striped mullet and sea bass--"our most valuable and expensive species"--feed here.

'It is Time to React'

[Question] Are the Mexican coastal lagoons polluted?

[Answer] They are polluted, but I believe that the degree still is not dramatically dangerous. However, it is time to react. It is not that we are being alarmists; we are being realistic.

It is sad that our country, which still is not developed industrially, is more polluted than the developed countries.

[Question] Would Mexico have to choose between pollution and development?

[Answer] I believe that there is a third possibility. We can develop without polluting. It costs a lot of money, but it is worth it because we are playing with our food supply and the health of the people.

[Question] What have been the effects on fishing of the spill of 6,880,000,000 liters of oil from the Ixtoc well into the Gulf of Campeche?

[Answer] A coordinating committee has been formed by the Department of Fishing, PEMEX and the Secretariat of the Navy to evaluate this situation. To date, the catches of shrimp and octopus have not decreased. We might have expected this with the latter specie, since it is very vulnerable because of the places where it lives.

However, we are studying the biological chain, for although the final product apparently has not been affected, there may be problems at some stage. In order to have a total view of the deterioration, we must wait at least accouple of years."

[Question] What is the species that is most sensitive to oil pollution?

[Answer] Oysters.

[Question] If the bodies of water and coasts should continue to be polluted at the present rate, what would happen to fishing?

[[illegible]] First the edible species would disappear from the rivers and the river[illegible]k populations would be affected. Later--principally due to the fertilizers--the breeding grounds would disappear from coastal waters.

[Question] How is the Department of Fishing acting against pollution in rivers, lakes and coastal waters?

[Answer] In some cases, when fishing is affected, we levy sanctions against industries that are polluting, as has happened with several sugar mills in Veracruz. But the responsibility for preventing and counteracting pollution in national waters, in the sea, rivers, lakes and reservoirs, etcetera, belongs to the Secretariat of Agriculture and Water Resources.

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HAIFA POLLUTION ENFORCEMENT IGNORED

Jerusalem JERUSALEM POST in English 19 May 80 p 3

[Article by Mary Hirschfeld]

[Text]

HAIFA — This city has the highest pollution rating in the country, but it also is the city which does the least about it, a top environmentalist charged yesterday.

There are enough municipal bylaws to keep both individuals and industries in line, said Dr. Yosef Shevel, but nobody knows about them. "And those who do won't lift a finger to improve the situation," he added.

Shevel, who is head of Haifa University's environment consciousness project, told a press conference here that he had offered his unit's help to the city authorities but had been rejected on the spot.

"The municipal environment quality department deals with air pollution measurements instead of taking preventive action," he said.

Most major American cities, Shevel said, have bylaws specifying the amounts of pollution allowed, and prescribing heavy fines for those who do not comply. "But unfortunately, we have no such thing here. As a result, when environment polluters are not called to pay for their excess, the people will — with their health. I am sure the situation in Haifa has already left a heavy mark on its residents," he said.

The environment consciousness project has just ended its "week of reinforcement of environment protection laws," jointly promoted with the Haifa police.

"The main idea was that people are simply not aware they are breaking the law when they smoke in the cinema, throw sunflower seeds on the floor, or litter the streets," Shevel said. "They are careless, not criminals. Thus we decided to teach them."

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BRIEFS

HAIFA POLLUTION--Haifa--City Hall is not to blame for the air pollution in Haifa, Mayor Arye Gurel said this week. "Our hands are tied because all major air polluters here are out of our jurisdiction. All we can do is complain to the government and ask them to act. But so far they have simply ignored us." In a special interview, Gurel challenged allegations made on Sunday by Dr. Yosef Shevel, head of Haifa University's environmental consciousness project, that Haifa is the most polluted city in the country. The Interior Ministry's environmental protection office has a monthly publication, "Biosphere," which records pollution levels in Jerusalem, Tel Aviv, Haifa, Ashdod and Beersheba, Gurel explains. "It shows that only once during the past 12 months has Haifa exceeded the tolerable pollution level--but Tel Aviv has also done it once. We have since remained far below the maximum level." Gurel said, "The oil refineries may be called the city's biggest air polluter. But they have enjoyed 'extra-territorial' status since the Mandate. We can't force them to use different fuels or to curb pollution. "Actually, there's precious little we can do without the government's help." The Nesher cement plant is also a major polluter, the mayor added. Although the cement plant is outside the city's jurisdiction, the wind blows all the smoke and stench to Haifa. City Hall's environmental quality adviser, Eli Eyal, denied reports that the environmental consciousness project had offered to help the municipality--and been rejected on the spot. "Dr. Shevel never approached us with any kind of programme or any particular suggestion. How could we refuse collaboration when we need all the help we can get? The only thing Dr. Shevel ever asked us was to participate in a joint press conference last week--which the mayor could not do because of a previous commitment." [Text] [Jerusalem JERUSALEM POST in English 22 May 80 p 3]

LEAD-SMELTING OPERATION CLOSED--Vulcan Automotive Batteries Co. has closed its lead-smelting installation in the bayside plant in response to municipal charges that it had been causing heavy air pollution. Dan Peled, Vulcan managing director, said last night that a new and larger installation has already been built at the Tefen industrial park in Upper Galilee. But he predicted a loss of several thousand shekels a week until the new plant is put into operation within a month or two. [Text] [Jerusalem JERUSALEM POST in English 9 May 80 p 17]

CSO: 5000

PLANS FOR PROTECTION OF ENVIRONMENT REVIEWED

Amman AL-DUSTUR in Arabic 6 Mar 80 p 5

[Article by Muhammad al-'Abadi: "On Occasion of celebration of World Day for Protection of Environment, Royal Support Given for Protection of Environment in Jordan; Two national plans for Afforestation and Replacement of Goats With White Sheep".]

[Text] For the first time today, there is being announced in Jordan and in more than thirty countries in various parts of the world, a world strategy for protecting the environment and preserving natural resources. It is the strategy which has a human, developmental and national dimension.

The Royal Association for the Protection of Nature will announce the strategy at a press conference to be held at 10 o'clock this morning, Thursday, in the meeting hall of Hussein Youth City.

Jordan's announcement of the strategy comes a very short time after the formation of a new government under the premiership of 'Abdal-Hamid Sharaf, which has established the first ministry of the environment in the history of Jordan.

To cover this subject from every aspect, I went to the ministry of municipalities and the environment. There, I had three meetings. The first was with Dr Jamal Al-Sha'ir, minister of municipalities and the environment. The second was with the engineer Hamdallah al-Nabulsi, director general of the housing agency. The third was with the engineer Sa'dallah, director general of the environment in the ministry of municipalities.

Dr Jamal al-Sha'ir

Dr al-Sha'ir spoke about the program for the celebration of World Day to launch the world strategy for protecting the natural environment, and about efforts which have been exerted, on all levels, to support affairs relating to protection of the environment in Jordan.

He also spoke about the government's futuristic views on protection of the environment from pollution, and said: "Anis al-Ma'shar, the president of the royal association for the protection of nature, will announce the world strategy for the protection of the environment at a press conference which he is holding for this purpose today.

Official and regular media are taking part in the celebration of this occasion, through press analyses and radio and television shows which stress the importance of celebrating this occasion, and its human, developmental, national and unifying dimensions.

Other official state agencies are taking part in the celebration of this day, each in its own way, and within the scope of its activities.

The ministry of agriculture, for example, will announce a general national plan of afforestation, and a phased program to replace the goat with white sheep.

The ministry of industry and commerce will announce special laws to combat industrial pollution in its various forms.

As for the ministry of education and instruction, it will announce a special day for arousing awareness about matters of the environment and the protection of nature. This will embrace all schools of the kingdom.

Dr al-Sha'ir stressed that the ministry of municipalities and the environment is striving hard to achieve the following aims, within a short time:

1. Stop pollution resulting from industries, whether on dry land, or on the shores;

2. Protect nature and its products, stop the spread of the desert, and reclaim receding natural fauna.

National Committee for Protection of the Environment

Dr al-Sha'ir spoke about the efforts exerted on the highest levels to protect the environment in Jordan, and about accomplishments made in this field in the past. He said:

A jordanian national committee for the protection of the environment has been formed in accordance with a resolution of the council of ministers on the 17th of the last month. This committee includes in its membership a large number of government officials.

Royal Support for the Committee

Her Majesty Queen Nur, the committee's honorary president chaired the first meeting of the committee which was held at the end of last month to prepare for the celebrations of World Day for announcing the world strategy for protecting the natural environment.

Her Majesty stressed during the meeting that His Majesty King Hussein was anxious to support the Committee's activities for the protection of Jordan's environment. She also stressed her support for the committee, and expressed her personal interest in its activities.

Dr al-Sha'ir asserted that the government is extremely concerned about the subject of the environment in Jordan and its protection from pollution. It was to emphasize this concern that the ministry of the environment was created. Many tasks and wide responsibilities have been assigned to it, and it is trying hard to fulfill these tasks and to carry out all its responsibilities in the protection of the environment.

Aims of Ministry of the Environment.

Dr al-Sha'ir spoke about the Ministry's future aims. He summarized them as follows:

1. Preparation of a comprehensive environmental policy, which would define the most exemplary exploitation of the land, and would aim at expanding the programs and schemes of afforestation and agricultural utilizations, and preserve the country's natural environment.

2. Preparation of an environmental policy, to preserve a sound, and healthy environment that is suitable for the Jordanian man to live in.

3. Preparation of a national environmental plan to protect nature in Jordan, by protecting fauna and flora resources.

The Director of the Housing Agency

Engineer Hamdallah al-Nabulsi, the director general of the housing agency, spoke about the agency's role in combatting environmental pollution. He said that the modern concept of housing communities does not mean the mere erection of buildings without taking into account the surroundings of man and human practices which might negatively affect the environment. Many of the housing communities which have been built have become blighted areas which have harmed the environment, because they have lacked the most basic services.

Hence, in new housing communities which the agency is building, provision is being made for the following basic services, which are the cornerstone of a good environment:

1. Sewage systems which provide cleanliness for the house, and prevent the spread of diseases and epidemics.

2. Water systems which provide the most important ingredient of cleanliness, even if it were not one of man's most obvious needs.

3. Green areas, which ensure a restful outlook for the community.

4. Supervision of housing density, so that it does not exceed international standards.

5. Children's playgrounds, which builds a sound body which gives a sound mind.

6. Social services in these communities, including social guidance among families and solution of private and general problems which arise as a result of their social relations as close neighbors whose children run into each other.

7. Social centers which have high aims that serve the community, like the library, and social, cultural and sports clubs.

8. Health centers which look after the residents.

The Environment in the Jordanian Concept

As for engineer Sa'dallah Sa'dallah, the director general of the environment, he is familiar with the environment in Jordan. He said that the environment consists of surroundings, namely the land, the air and the water. The land in Jordan was full of trees in ancient times. A small number of inhabitants lived in its western part, while the eastern parts were green. But with the passage of time, the fertile topsoil was carried away from the hilltops and moved toward the valleys. This process left in its wake bare, isolated lands and rocky, exposed hills. The lands of Jordan had turned into desolate areas which had little vegetation.

As for the air in Jordan, it is generally of good quality, except that there are many problems caused by various factors which are active in polluting it, like the pressure of heavy traffic, the smoke of factories, the burning of refuse, and noise.

As for water, its pollution usually results from waste water and the waste of factories.

Problems of the Environment

Sa'dallah spoke about the basic problems of the environment in Jordan. I might summarize these as follows:

1. An acceleration of economic and social changes, in an atmosphere of growth of urban population, dispersion of rural dispersion, and typical social and environmental conditions impacted by deterioration of the sources of life (land, water and air).

2. The loss of balance between the main constituents of productive land, and the fragmentation of properties for commercial and industrial ends, which led to encroachment upon agricultural and rural lands.

3. The lack of development plans for accurate environmental studies, which has led to an increase of pollution problems, and a decline in the quality of the environment.

4. The absence of comprehensive regional planning, and absence of organized, comprehensive and integrated studies, which has led to aggravation of environmental problems.

5. A lack of capabilities and proper division of responsibilities, which are scattered in different organizations.

The problems of the environment are unlimited. Poverty is one kind of decline of the environment. The housing crisis, poor health services, malnutrition, and all our living, economic and cultural problems are another kind of decline of the environment.

Putting an End to Pollution of the Environment

In order to put an end to this malady, we must start a process of education, which should be given the name of environmental education. This education should embrace the student in his school, the worker in the factory, the farmer in the field, and the baby in his home. It is an activity which should continue throughout life, and it ought not to stop at a definite point.

Engineer Sa'dallah stressed the necessity of linking development with the environment. He said that a strategy of protecting, improving and developing the environment is to a large extent compatible with growth. They are two connected matters, and there should be no conflict between them.

He called for the use of land resources in a way in which it would be possible for them to be passed on, like a protected and a rich legacy, to future generations.

He said that this sense of responsibility toward future generations forms an important aspect of awareness of environmental problems, and the need to solve them.

Accomplishments of Directorate of the Environment

Engineer Sa'dallah spoke about the directorate of the environment's accomplishments from its establishment until today. He said that during the very short interval in the life of this directorate, a detailed plan has been prepared of the ministry's activities in the fields of the environment and development. There has been prepared a schedule of the needs of the functional, technical and administrative departments which would be in charge of the improvement of the environment. Programs have been prepared for vocational training courses for Jordanians,aand the basic framework of the purposes of environmental studies has been drawn up.

We have been associated with the Jordanian national committee for the protection of the environment, Sa'dallah said. We have reviewed the drafts of laws relating to national gardens and parks and to protection of the coasts from pollution; a study of plans for lands required for sanctuaries; and a revised draft law on the national plan for afforestation.

These accomplishments, as engineer Sa'dallah said, are the start of a great job. We will become aware of this great job when these projects get under way, he said. That is because the present government is the first government which has put together all the ideas and studies concerning the protection of the environment. It has entrusted them in one comprehensive package to the ministry of the environment. This in itself contributes to the realization of great accomplishments, he concluded.

9397
CSO: 5000

MODERN HOUSES SINK IN SALT FOUNDATION

Jiddah ARAB NEWS in English 10 May 80 p 3

[Text] Jeddah, May 9--The southern port town of Jizan is threatened by salt.

Jizan was built on a mountain of salt, but because in the past houses were made of hay and reed, the salt foundation held. In the event of any huts collapsing, it would always be easy to replace or rebuilt, Saudi Business reported.

The report states that the port, which was rebuilt and enlarged and became the main harbor for the southern region, brought an additional influx of money that seeped down among the people. As Jizanis became relatively more prosperous, they built better homes using concrete, steel reinforcement bars, brick walls and cement ceilings.

But these houses proved to be too heavy for the salt foundations. Many have now begun to sag. A few have collapsed completely, while others have lost parts of their walls.

Stories of "disappearing" houses abound in Jizan. The Managing director of Al Bandar International Company in Jeddah and Jizan, Adnan Salah, said some families would wake up in the morning to find themselves literally in the open, the house having sunk during the night.

Salah estimated the salt mountain to be 40 meters deep. "It is the largest salt resource in the Kingdom," he said. Someday the government, through the Ministry of Petroleum and Mineral Resources, might consider mining it. "It is good, edible salt," he said, "but simply no good to build houses on."

When the situation became untenable the government, through the local emirate of Jizan, banned further buildings in the city to prevent damage and possibly loss of life. The Ministry of Municipal and Rural Affairs asked a company called Serete to prepare a study for the construction of a brand-new Jizan, somewhere else, though not too far from the salt mountain which, because of the intense humidity of this Red Sea coastal region, actually melts in some places.

A ministerial committee was formed to review the company's study under the chairmanship of Prince Miteb, Minister of Public Works and Housing. Other members included Minister of the Interior Prince Naif, Prince Majed, then Minister of Municipal and Rural Affairs, and the Minister of Finance and National Economy Sheikh Muhammad Aba Al-Khail. A subcommittee was formed under the leadership of the Governor of Jizan, Prince Muhammad ibn Turki Al Sudairy and the Deputy Minister of Municipal and Rural Affairs Omar Qadhi. The company, a joint venture between the French concern Serete and the Saudi engineering firm of Abdul Rahman Kashmiri, recommended a site 12 kilometers to the north of the dwindling city on the road to Sabiyah and Abha.

The government in Riyadh approved the scheme, and work on the city was to have started a year ago, according to Salah, whose company is deeply involved in the construction of the new city. But the people of Jizan objected to the site and petitioned Crown Prince Fahd to reject the company's recommendation on various grounds.

Prince Fahd formed a committee of deputy ministers to study the petition and make another and independent recommendation. In a few months, the report was submitted to Prince Fahd upholding Serete's recommendations. There was little to justify the people's protests, the committee decided.

The urgency for a new town that can accomodate more people is growing rapidly. Dumetz enlarged the port from one dock to seven and a Greek company has just won a contract to execute phase II of the expansion of the port. It was suggested that the new town should have no fewer than 15,000 housing units in its first phase.

Al Bandar International Company then offered to build 1,000 units immediately to launch the scheme by borrowing the money for it from the Real Estate Fund, which normally offers up to 70 percent of the cost of a house as a 25-year interest free loan. The company invited those interested in building homes to subscribe to its scheme authorizing it to borrow money on their behalf from the fund.

"We will then try to build the houses within the limits of the amount received from the fund," Salah said. "In this way the owners will not be asked to pay up the balance." Subscriptions poured into Al Bandar at SR10,000 each.

CSO: 5000

INSPECTION TOURS OF DROUGHT AREAS UNDERTAKEN

Diplomatic Tour

Addis Ababa THE ETHIOPIAN HERALD in English 13 May 80 pp 1, 8

[Text]

DIRE DAWA (ENA) — Ambassadors of various countries based here in Ethiopia and representatives of development and aid agencies on Friday toured the provinces of Jijiga and Degahabur to assess the extent of damage caused by drought.

The ambassadors and representatives were shown around the drought stricken area by Comrade Beshir Sheik Abdi, the deputy administrator of Hararghe region and Major Tesfaye Birhanu, the deputy commissioner of the Relief and Rehabilitation Commission.

Comrade Master Technician Habte Wolde-Hanna, the administrator of Jijiga province told the group of diplomats that international aid is urgently needed to save the lives of the inhabitants and their livestock. He noted that nearly 300,000 heads of cattle have already perished because of drought.

In the El Hamar locality, in Jijiga the diplomats observed the distribution of relief aid obtained from different sources. They also saw a total of 450 children, disabled persons and women queing for aid in the settlement center which was prepared for them by the Commission.

The ambassadors and development representatives proceeded their tour to Degahabur provnse where they visited a settlement center caring for 7,674 families.

The provincial administrator Comrade Mohammed Eyob briefed the foreign visitors that international aid was urgently needed to feed the influx of families flocking to the settlement center.

He also informed the diplomats that the reactionary Mogadisho regime is misleading world public opinion under the cover of 'aid for refugees from Ethiopia' so as to obtain assistance for the maintenance of its own regular army.

Before their departure to the drought stricken areas, on Friday the diplomats were briefed by Comrade Col. Zeleke Beyene, the Chief Administrator of Hararghe region on efforts underway to withstand the consequences of drought. The Chief Administrator pointed out that notwithstanding the measures being undertaken locally that international assistance was very essential to contain effectively the fatal effects of the disaster.

Committee Inspects Relief Efforts

Addis Ababa THE ETHIOPIAN HERALD in English 17 May 80 p 5

[Text]

JIJIGA (ENA) — The committee recently established at a regional level in Harar town to assist the drought affected inhabitants of the provinces of Jijiga and Ogaden last week toured the disaster areas and inspected the relief and rehabilitation efforts in progress.

The seven member Committee led by Comrade Colonel Hailu Amare observed relief aid being distributed to the needy during its work tour of settlement centres in Elhamer, Belafiisa, Tulu Gulled, Kebri-Beyah and other localities in Jijiga provinces.

The members of the Committee held meetings with members of the seven sub-committees of Jijiga province last Tuesday at the provincial office to deliberate on the speedy and satisfactory delivery of food and medical supplies to the drought affected compatriots.

During its discussion the committee pinpointed some weakness of aid deliveries in some localities and made recommendations to strengthen the work of the sub-committees.

The Committee also pledged to alleviate problems that would retard relief and rehabilitation efforts.

CSO: 5000

BRIEFS

RAIN DAMAGE--Addis Ababa--Property worth 22,000 Birr was damaged on Tuesday in Nekemte town, Wollega region, by torrential rains and gusty winds. The 20-minute downpour and persistent gusty winds tore off the roofs of a garage and offices of the regional policy while 19 other houses belonging to individuals were damaged by the same calamity. Similarly eight people received serious and minor injuries when hit by lightning that fell in a school during heavy rains in Arbegona district, Sidamo region, last week. [Text] [Addis Ababa THE ETHIOPIAN HERALD in English 16 May 80 p 6] Addis Ababa--A five-room residential unit belonging to a peasants' association was badly damaged in Dembia province, Gondar Zuria province, as a result of rain and gusty wind. The affected peasants are presnatly being rehabilitated, according to a report by the district administrative office. In a similar development, in Hagere Mariam district. Arero province, Sidamo region, eight residential units, were demolished by flood following a heavy downpour. Property kept in the houses was swept by the flood which also inundated a maize field, it was disclosed by the district's head of administrative services. [Text] [Addis Ababa THE ETHIOPIAN HERALD in English 17 May 80 p 8]

AFFORESTATION CAMPAIGN--Addis Ababa--A total of 109 million tree seedlings have been prepared for this year's massive afforestation campaign which is to be carried out through the country, a monthly bulletin puglished by the information and public relations service of the Ministry of Agriculture disclosed. The afforestation will be undertaken according to the bulletin, by the concerned government agency and the various peasants' associations. The bulletin described this year's afforestation work as a major venture. The regular afforestation work to be carried out by the government alone is envisaged to cover 20,000 hectares of land, it was learnt. [Text] [Addis Ababa THE ETHIOPIAN HERALD in English 17 May 80 p 8]

FLOOD DAMAGE--Dessie--Torrential rains and lightning claimed the lives of two persons and devastated residential houses of nine individuals this week in Alamata district and Kemissie town, Wolo region. In Alamata district, six tin roofer and three thatched houses were devastated during a downpour that lasted for an hour. Two persons died and a third was wounded in Kemissie town, of Kalu province, due to lightning, according to reports from the district's administrative office. [Text] [Addis Ababa THE ETHIOPIAN HERALD in English 8 May 80 p 6] Mekele--A total of 110 cattle and pack animals were swept away by flood following a heavy downpour on Wednesday in the Melekot peasant association locality in Inderta district of Inderta province, Tigrai region. A field of maize cultivated by irrigation was also destroyed by the flood, it was disclosed by the administrative office of Inderta district. [Text] [Addis Ababa THE ETHIOPIAN HERALD in English 10 May 80 p 8]

CSO: 5000

IMPORTANCE OF AIR-POLLUTION CONTROL LAWS DISCUSSED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 20 Mar 80 p 2

[Article by V. Selyunin, Economic Reviewer of "Socialist Industry": "A Most Important Item"]

[Text] Our readers have expressed their approval of the Air Pollution Control Act. "Remarkable, a very necessary law" writes labor veteran V. Ivanov (town of Asha, Chelyabinsk Oblast). "This is one more striking illustration of the concern of the Party and the government for the health of present and future generations of Soviet peoples," notes lawyer A. Orlov (Moscow). "The adoption of the law will be a major event in the life of the people" assumes Uzbek SSR Academy of Sciences Academician N. Lavrov. Each of those who sent a letter offered his or her own suggestions for the project.

The general opinion is that the document outlines rather substantial measures aimed at control of harmful emissions. However, our readers assume it is not as complete in outlining how to forestall such emissions in the production process. Waste-free production is most promising. Moreover, Academician N. Lavrov proposes the inclusion in the law of an article which stipulates participation of scientific research and design organizations in the development of technological processes which would prevent air pollution. He also supports creation of a scientific center on environmental hygiene. It is possible to use the present Communist Subbotnik for this purpose.

The letter writers unanimously approve of the Article 11 of the project which requires that enterprises be equipped with emissions purification apparatus. Construction engineer V. Palishin (Moscow) said it well. "Here there can be no avoidance of the importance of the unit or for the early construction of it. We believe the most important item is the native land and we are obliged to pass it on to our offspring intact and safe."

Our readers cite, with civic concern, cases of an irresponsible attitude toward nature. Volgograd resident N. Goncharov writes. "At the foot of

Mamayev burial ground sometimes automobile headlights must be turned on even in the daylight. The "Barikady" tractor and aluminum plants work hard around the clock." Leninakan "Mikroelektrodvigatel'" plant worker A. Feofanov reports "Alaverdi Mining and Metallurgy Combine polluted the atmosphere so much that the workers' towns must now be located far from the enterprise. Too many bees are dying and peach orchards are dying out." Comrade Feofanov called the attention of the Gosplan of the Republic to these facts in 1972 and, in response, received assurance which says that measures are being drawn up and the situation will change in the immediate future. The reader enthusiastically supports those articles of the project which describe the participation of the community in air pollution control.

V. Ivanov (Chelyabinsk Oblast) expresses his thoughts on this matter: "After all sources of pollution have been located and listed, we should compile, for each of them, a graph with precise schedules for removal of harmful emissions. These documents should be announced publicly. Without specific charts and the monitoring of them, the matter amounts to only talk and promises."

Many letters call for pure air at any price. The thought, at first glance, is attractive, however, economics loves exact accounting. "I am now occupied in development of a system for monitoring emissions," reports engineer V. Vasil'yev from Dnepropetrovsk Oblast. "The system is very expensive. One analyser costs nearly 11,000 rubles. And is the system effective? We do not know because there is no cost evaluation of the air."

In addition to cost evaluations, in the opinion of A. Orlov, it is also necessary to introduce norms of air consumption by enterprises. These measures would provide an economic incentive for introduction of gas scrubber installations.

Air pollution control measures must provide standards of maximum permissible concentrations of harmful emissions. Ecologist V. Vishnyakov (town of Bolshevo of Moscow Oblast) writes: "Pollutants are carried high into the atmosphere. This means, that, together with local emissions, there appears in many points, emissions carried over great distances, the so-called background concentration. I propose the insertion into Article 10 of the project of a call for the registration of these concentrations for determining the maximum permissible emissions."

Perhaps the most discussed theme in our mail to the editor concerns the air pollution arising from transportation. It is quite clear, thanks to major and expensive measures, in the present Five-Year Plan, air pollution from stationary items was reduced significantly, however, an overall emissions reduction did not occur precisely because the amount of automobile exhausts increased. Moreover, these pollutants are concentrated in a limited area over the most densely populated areas of the country. Readers suggest that the first concern of executive committees of local Soviets is the review of location of highways. They should be located as far as possible from residential centers. Engineer V. Palishin proposes for oxygen restoration that "all available space in towns be planted with shrubbery." He reports the amazing experiment of the mechanized column trust "Uralneftegazstroy" "there is not a single automobile in its workers settlement and trees are maintained." Previously mentioned veteran of labor V. Ivanov thinks "The law should set a minimum of planting of trees and shrubs for each city dweller."

Scientist-chemist M. Lerner (Moscow) expresses such an opinion: "Article 15 of the draft correctly emphasizes the responsibility of organizations which design, produce and operate motor vehicles. However, the quantity and harmfulness of emissions depend not only upon the construction, let us say, of an automobile but also upon the quality of the fuel. Presently used fuel additives are simple and cheap but they contain lead. Therefore they produce especially dangerous emissions and the cost of neutralizing these emissions is much greater than the economic effect from improving gasoline quality. I think that such additives should be forbidden and the law should also make fuel producers responsible for such harmful emissions."

Finally, the letter writers propose rigid monitoring of norms of emissions both from motor vehicles and other air pollution sources. Public procurator R. Ryabin (Moscow) presents a rather voluminous list of enterprises which are polluting the air. In his words, "the use of such natural resources as the earth, it depths, the water, and forests is regulated in detail by law. We cannot say this about air; here acts setting standards are few and present different approaches to the problem. Thus, the Criminal Code of the Ukrainian SSR, generally, has no norms concerning responsibility for air pollution. I think that Article 27 of the law must state that union republics are to establish criminal responsibility for harm inflicted upon nature."

A letter from Chelyabinsk Oblast states that one out of three ferrous metallurgy enterprises which pollute the air are not equipped with gas scrubbers. One quarter of the orders of the regional state inspection is not being carried out here. "The authority of environmental protection agencies must be increased," concludes the public procurator. "This would require the naming, in Articles 5, 23 and 25 of the law of agencies authorized to monitor air pollution control."

The law is not yet adopted but many readers already perceive it as a program of action for them personally. The Kievan A. Boyko, resident of the town of Shakta N. Nedzel'skiy, F. Sobkalov from Voronezh and others express their readiness to apply their efforts to the glorious matter of environmental protection. They ask for addresses of organizations to whom they should turn. The answer to this is simple: every enterprise and any natural region is a field for warm hearts and skillful hands.

2791
CSO: 5000

ARMENIAN COUNCIL OF MINISTERS REVIEWS ENVIRONMENTAL PROTECTION PERFORMANCE

Yerevan KOMMUNIST in Russian 6 Apr 80 p 2

[Article: "For the Purity of the Environment"]

[Text] The Council of Ministers of the Armenian SSR noted that the republic has performed a certain amount of work toward improving the protection of the environment. Nature protection facilities that have been put into operation include: the first phase of the Yerevanskaya Aeration Station, biological purification plants in Alaverdi, local purification plants at industrial and transport enterprises, a water recycling system, an electric filter on a rotary furnace at the Razdanskiy Cement Plant, and four electric filters at the Alaverdskiy Mining and Metallurgical Combine.

Annual land conservation measures include: the construction of hydrotechnical facilities for the control of erosion and mud flows; the reinforcement and forestation of ravines, gullies and other nonagricultural land; agrotechnical soil protection measures; and the grading of already irrigated land.

The Council of Ministers of the Armenian SSR noted that notwithstanding the measures taken, the pollution levels in the major bodies of water and air pollution in republic industrial centers remain high.

The Ministry of Industrial Construction, Ministry of Rural Construction, Ministry of Housing and Municipal Services, Ministry of Light Industry, Ministry of the Food Industry, Ministry of the Meat and Dairy Industry, Ministry of Motor Transport, Administration of Nonferrous Metallurgy, Main Administration of Installation and Special Construction Work; the Board of Aykoop [expansion not given], and the ispolkom of the Yerevankiy City Soviet did not to the full extent meet the targets indicated in the decree of the Central Committee of the Communist Party of Armenia and the Council of Ministers of the Armenian SSR "On Measures for Improving the Protection of the Environment."

As a result of the unsatisfactory work of construction organizations and certain clients, the construction and activation of sewage treatment plants are proceeding at a slow pace and capital investments allocated for this purpose are not completely utilized. Deadlines were not met for the activation of sewage treatment facilities in Leninakan, Dzhermuk, Spitak, and the village of Kakhsi; for the activation of water recycling systems and sewage treatment facilities at the Alaverdskiy Mining and Metallurgical Combine; for halting calcium carbide production in the Nairit Science-Production Association, etc.

The State Committee for the Utilization and Conservation of Surface and Subsurface Water Resources, the Armenian Republic Administration for Hydrometeorology and Environmental Monitoring, and the Ministry of Health, which have the responsibility of monitoring the implementation of measures indicated in the decrees of directive organs, tolerate violations of these decrees and of nature conservation laws.

The Council of Ministers of the Armenian SSR issued a stern warning to the ministers of industrial construction, rural construction, and housing and municipal services and to the Chief of the Administration of Nonferrous Metallurgy regarding the systematic nonfulfillment of annual plans for the construction of sewage treatment plants and the failure to put them into operation on schedule.

The Council pointed to the unsatisfactory fulfillment of the aforementioned decree of the Central Committee of the Communist Party of Armenia and the Council of Ministers of the Armenian SSR by the Ministry of Light Industry, Ministry of Food Industry, Ministry of Meat and Dairy Industry, Ministry of the Construction Materials Industry, Ministry of Motor Transport, and the Board of Aykoop which slows down the effort to eliminate noxious, environmentally harmful effluents from housing and municipal services, industry, and motor transport.

The Council also noted the unsatisfactory work of the Ministry of the Construction Materials Industry, the Ministry of Industrial Construction, the Ministry of Land Reclamation and Water Economy, and the Ministry of Agriculture on the recultivation of previously cultivated land. They are ordered to take every possible measure to fill the gap and to secure the unconditional fulfillment of the plan for 1980.

Ministries, departments, organizations, associations, and enterprises of union subordination are instructed to take the necessary measures to ensure the unconditional fulfillment of the targets of the aforementioned decree, to carry out all the indicated measures, and to report on their fulfillment to the Council of Ministers of the Armenian SSR in February 1981.

5013
CSO: 5000

PROBLEMS IN GEORGIAN ENVIRONMENTAL PROTECTION

Tbilisi KOMUNISTI in Georgian 1 Mar 80 p 1

[Editorial: "The Environment Is Our Big Home"]

[Text] Probably all of us recall the short story "The Old Man and the Pear Tree" in "Deda Ena," by our beloved writer and public figure Iakob Gogebashvili. And we probably also recall the old man's wise answer to the curious little boy who asked his grandfather what he was doing:

"I'm planting a pear tree, my boy. Perhaps I won't live to see it bear fruit, but others will, and they will remember me with gratitude. Even the bee does not work just for himself, and surely humans should take care for others."

This wonderful idea of love for nature and the environment, for making it healthy and new, an idea which the writer presented to young readers in such a popular way, has really taken wing now among us. To enhance the environment and make it healthy, to transform nature, and in general to take care for man's wellbeing is always at the focus of the party's and Soviet government's attention.

As a result of integrated efforts on a nationwide scale in our country, cleaning up the environment has been placed on an industrial basis on which hundreds of millions of rubles are spent every year. This and other vital state matters were again the focus of attention at the November 1979 CPSU CC Plenum and the Second Session of the USSR Supreme Soviet 10th Convocation, which decreed that 1.9 million rubles be spent on environmental protection and the rational use of natural resources. In our republic, 83.7 million rubles are earmarked for this purpose.

Thanks to the concern of the GCP CC and the republic government, a broad and scientifically substantiated program is being implemented to landscape the cities and prevent pollution of the atmosphere and surface waters. Along with other measures, work on cleaning up the environment has undoubtedly benefitted from last May's GCP CC and GSSR Council of Ministers decree "Additional Measures to Strengthen Environmental Protection and Improve the Use of Natural Resources in the Georgian SSR."

Considerable progress has been made, for example, thanks to practical efforts by party, soviet, and economic organizations in Tbilisi, Kutaisi, and certain other cities and industrial centers. In Tbilisi, a number of enterprises which were polluting the environment have been moved outside the city; in many places, new technological processes have been adopted, furnaces and machinery have been replaced, and gas, dust, and water scrubbing equipment has been installed. Consider, for example, that now the Rioni is relatively less polluted by dirty waste water and residues. Efforts against environmental pollution are now regularly discussed by the gorkom, the gorispolkom, and the city soviet. Much good work is being done by the permanent commissions and the people's control organs. Some progress is being made along these lines in Rustavi, Sukhumi, Batumi, Tskhinvali, and other industrial centers.

This is all well and good, but in these and other cities there are still substantial shortcomings in efforts to clean up the environment. Through the fault of a few enterprise managers and their inflexible efforts, the environment is being polluted, causing damage to the flora and fauna. The situation is especially bad at the Zestafoni Ferroalloy Plant, whose furnace exhaust gases are polluting not only the Zestafoni area but also other rayons and cities. The rayon's party and soviet organs and the plant's management have manifested blatant inaction and helplessness in the face of the situation. Because of this and other serious shortcomings and infractions, the GCP CC had to take stern measures against those who were neglectful of their duties and map out appropriate measures to correct the situation.

Environmental protection requires the constant attention of local party and soviet organs. Integrated measures are needed along these lines. Naturally, before taking any practical step it is essential to draw up scientifically-substantiated recommendations to measure 100 times before cutting, so to speak. The right thing was done, for example, by the Poti Gorkom and the republic State Committee for Environmental Protection, when they held the recent republic conference on current problems of preventing pollution of the Black Sea. It was participated in by the hydrometeorological and sanitation services, Gruzrybestroy, automotive and maritime transport officials, and other officials.

The drafting of reasonable recommendations is one aspect of the matter, of course, but the main and decisive thing is to see to their implementation, to supervise the work in a timely and correct fashion.

What happens all too often, unfortunately, is that we have recommendations and plans but the practical work moves forward too slowly. For example, work to protect rivers and waters against pollution is not going satisfactorily in the republic. Most of the equipment installed to protect more than 320 bodies of water against pollution is not working right. Obviously, it makes little sense to speak of effective environmental protection.

It is for this reason that pollution still afflicts a number of Georgia's rivers--the Kura, the Rioni, the Alazania, the Kvirila, the Suramela, the Tkibula, the Galidzga, the Tskhenistskali, the Inguri, the Bzipi, and others. Our rivers and bodies of water are suffering considerable damage due to failure to comply with regulations governing the storage and transporting of chemicals and fertilizers. It should also be mentioned that waste water treatment in livestock complexes and poultry plants has not yet been resolved, and the environment is suffering accordingly. Stern state measures are necessary to straighten this situation out. It would be a good idea for the performance of plant and organization officials to be evaluated in accordance with what practical measures they are taking to see to it that the environment is cleaned up and protected.

The 7 February issue of this newspaper reported to its readers that this year it will broadly publicize current issues in environmental protection and the rational use of natural resources. Today's issue launches a new rubric: "Nature--The Key to Life."

This generation's noblest obligation is to do all it can to ensure that our big home, our precious environment, nature is kept abundant, rich, beautiful, and attractive for future generations, who will live on this land of ours tens and hundreds of years hence.

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USSR

SOME ECONOMIC PROBLEMS ON RATIONAL USE OF NATURAL RESOURCES

Moscow EKONOMICHESKIYE NAUKI in Russian No 12, 1979 pp 72-74

[Article by P. Lemondzhava, docent, candidate of economic sciences (Tbilisi)]

[Text] At the present stage of development of society, ever greater importance is attached to theoretical analysis (closely associated with practical aspects) of the problem of efficient use of natural resources and protection and sanitation of the environment as a natural basis for economic production. At the 25th CPSU Congress, it was noted that "Soviet scientists must not lose sight of the problem of environmental protection and population growth which are worsening recently. Improvement of the socialist use of nature and development of an effective demographic policy are important questions involving the entire range of natural and social sciences."[1]

It is well known that the process of industrial operations of society always includes its systematic interrelationship with the natural environment. The relation of man and nature assumes not only the active use of nature, but also the protection and revewal of natural resources. The relationships between peoples accruing during this are an element of the system of economic relations, inherent to this or that method of production and determined by the ruling form of ownership in the means of production.

All of these general situations acquire special importance under the conditions of the modern scientific and technical revolution when the scales of effect of man on nature increased vastly, primarily in connection with the rapid development of industrial production and an unprecendently complex economic-ecological system was formulated within the framework of which is required a constant observance of proportions as close to optimal as possible. Infringement of such a kind of proportion is fraught with great danger, since, under present conditions, the capacity of the natural environment for self-purification and self-renewal cannot be realized completely without the rational intervention of society into this process, without man "helping nature." The process of social reproduction includes, consequently, systematically mapped out and realized measures for the protection and sanitation of the natural environment and the ensurance of the rational renewal of its systems. Even the very statement of the problem of the use of nature in its contemporary aspect indicates the fact that only a Socialist society, as opposed to Capitalism, can continuously successfully manage this problem.

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[1] Proceedings of the 25th CPSU Congress, Moscow, p 73, 1976

In his delivery of the summary report of the Central Committee of the Party at the 25th CPSU Congress, comrade L. I. Brezhnev noted, in particular, that "Nature can be used in different ways. It is possible, as the many examples in the history of man have shown, to turn it into barren, lifeless spaces ravished by man. But it is also possible, and necessary, to improve nature, to assist nature in the more complete development of its vital forces. The expression "blooming land" is so simple and well known to all. This is what we call a land where the knowledge, the experience of people, their livingness, their love for nature truly work wonders. This is our socialist way."[1]

The realization of this way requires, obviously, an appropriate approach to socialist reproduction. Under present day conditions, it must be considered not only as reproduction of the combined public product, of socialist production relationships, labor resources and means of production but also as the reproduction of life-ensuring systems of the natural environment.

The achievement of the highest goal of socialist production, the ensurance of the total well-being and free, multiform development of all members of society, requires the ecological equilibrium necessary for the normal vital activity of the people and without consideration of this circumstance it is impossible, we believe, to discover the true substance of the basic economic law of socialism. By this means and methods of use of both the present law and other economic laws of socialism are determined. The use of nature is a complex problem which includes, together with the decisive economic aspects, technical, organizational and social aspects. Environmental protection and rational use of natural resources affect not only the increase of economic effectiveness of production but also the conditions of work and leisure and different aspects of the welfare of the workers.

The systematic nature of socialist production creates the possibility of and the necessity for complex planning of measures for the protection and rational use of natural resources. Only on a systematic basis can and should, under socialism, be solved such problems as the sequence of involvement of natural resources into public production and conditions of their utilization, the prevention of possible harmful effects on man's natural environment during this (water pollution, atmospheric pollution, soil erosion, etc.). The complex nature of the very problems of the use of nature suggests a complex approach to the planning of the use of natural resources and of all processes affecting the natural environment. The complex plan must provide allocation of special capital investments, directed to protection and sanitation of the natural environment, especially for construction and use of installations for removing industrial and household pollutants from the air, for water pollution control, the resotrations of forests, etc.

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[1] Proceedings of the 25th CPSU Congress p 53.

There is still no specific method developed for calculating the social and economic losses to society from environmental pollution. Therefore, it is frequently impossible to compare the expenditures required to prevent them with the real effect which such expenditures will provide. The solution of this problem will provide a stimulus for the use of the most effective and radical methods of environmental control. As existing calculations show "the approximate economic effect of measures mapped out for air and water protection and wind and water erosion prevention may constitute 4 billion rubles per year (including more than 2 billion rubles to reduce air pollution). The terms of recovery of capital investments in environmental protection appear to be much shorter than normative (terms)"[1],

Causes of the harmful effect of industrial activity on the natural environment are, in particular, the imperfection of the technological process or the absence of control of it, the necessity for significant additional expenditures on measures for protecting and renewing natural resources. To this, we must add the fact that determination of the effectiveness of investments in the rationalization of the use of nature faces definite difficulties caused by freedom from cost for concessions to the direct users of them, that is, enterprises (unions) show an economic disinterest in a possibly more rational use of the riches of nature. There does not exist, to date, indicators of a plan which would especially reflect the work performed by direct users of nature for the protection and, possibly even more, the improvement of the natural environment. In our opinion, expenditures for these purposes should be derived from the production development fund and in amounts provided for by the plan.

Since the protection and the renewal of the natural environment require significant and ever-growing state expenditures, it would be beneficial to introduce, for all enterprises, differentiated deductions for the environmental protection fund, the funds from which would be directed into the state budget for centralized use for the purposeful needs indicated. In order to shift the use of such natural wealth as, for example, water resources, to a cost accounting basis, many economists have proposed for years introduction of payment for such kind of resource. This problem was solved definitely, we assume, so that further rational use of nature will be facilitated. During calculation of such indicators of economic effectiveness of industrial and economic activity of enterprises as labor productivity, production cost, profit, profitability, attention should be given to ecological changes which are due to the activity of enterprises.

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[1] Problems of Economics, No 10, p 42, 1972.

It would be advisable to develop "A statute on the Economic Incentive of Enterprises for Successful Environmental Protection, Rational Use of Its Resources and Fulfillment of Measures Intended for These Purposes." Enterprises which do not fulfill plan tasks for environmental protection and rational use of its resources should pay compensation from their profits for economic damage inflicted by them and the workers who are directly guilty of this should bear the economic responsibility. The use of such economic levers will facilitate the solution of this especially burning questions.

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ENVIRONMENTAL POLICIES FOR DESERT AREAS DISCUSSED

Moscow PRAVDA in Russian 20 Jan 80 p 3

[Article by M. Vasin and N. Morozov (Special correspondents): "Is It Necessary To Take Care of the Desert?"]

[Text] A light breeze blew, and along the highway, a black arrow cutting through the Kara Kum, creeped yellow serpents. The moving sand dunes smoked like volcanoes near the road.

We got out of the car and began to climb the nearest sand dune. Our feet sank almost to the knees in the loose mass. In sweaty ranks, we climbed to the top. Before us appeared the endless stormy sea of the desert.

"Crossing the scorching expanse of sands has been considered a great feat since ancient times," says director of the Turkmen SSR Academy of Sciences Desert Institute A. O. Ovezliyev." The considerate, cordial relationship to travelers by the local inhabitants since olden days made into a cult is no accident. Hitherto there was a proverb among the Turkmen 'Treat as a guest for 3 days but, on the 4th ask their business.'"

Today the Kara Kum already, it may be said, is growing roots; along and across it cut railroads and macadam roads, oil lines and gas lines and irrigation canals. However, the people here frequently feel quite uncomfortable. Nevertheless, they are going and staying in the desert, they are settling in it and working there.

The appearance of the inclement land is being changed. Regrettably, however, not only for the better. Lakes are drying up and the bared bottom is being transformed into dead salt marshes, or, on the contrary, a swamp arises among the sandy ridges. The flat areas covered with scant vegetation suddenly begin to become humpbacked by crescent-shaped hillocks--by the moving sand dunes, inevitably moving heavy waves of sand along the boundless spaces.

Scientists who observe the state of the Kara Kum maintain that in some places nature is begging for mercy. Deserts are one of the most sensitive and easily injured landscapes on earth. Disturbing the unstable equilibrium of the environment here, we might provoke a violent reaction of nature. Therefore, we must respect and care for it.

But, it is asked, why preserve such sterile spaces?

We must not jump to conclusions, warns president of the Turkmen Academy of Sciences A. G. Bavayev, corresponding member of the USSR Academy of Sciences. Do not hurry to pass a death sentence on the desert. Desert is not a synonym for a void. It is by no means hostile to the person who knows its peculiarities and laws and respects them.

Here is the most inexpensive animal husbandry production and the cost is 30-49 percent lower than the average for the country. In the threatening Kara Kum--Black Sands--are vast tracts of fairly good pasture lands, upon which cattle may graze almost the year around. Many winters are so mild that the vegetating of plants stops for only 10-20 days. According to calculations of scientists of the Desert Institute, only 3 of the last 10 years in the pasture areas were unproductive, while 3 years were good and 4 years were satisfactory.

Central-Asian livestock breeders since olden days pastured sheep on almost all the territory of the desert. It seems it is not so arid as is supposed. Central Asia and Southern Kazakhstan annually receive precipitation amounts equalling 4 years of the flow of Amu-Dar'ya River. The nomads have begun to store water. For thousands of years, the national hydrotechnology was thought out to the last detail; magnificently implemented.

Subtropical crops grow in the Kopet Dag zone, producing two and even three harvests of fast-ripening farm plants. In the southern Kara Kum, it is possible to grow vegetables, flowers and lemons in the winter, as shown by kolkhoz practice, by covering them only at night for a very short period of time. However, mainly, in the desert zone of Central Asia, fine-fiber cotton grows, which is found in so very few places.

Of course the dry climate is beneficial for the human organism. It is no accident that the only climatological kidney sanatorium in the country (and one of the few in the world) was established exactly in the desert. In the health resort respect, Kara Kum and Kyzul Kum are still untouched virgin soil. They also remain an untouched tourist attraction. Where else do you see remains of such ancient civilizations and also "Martian" hills where you can still journey among the sands on a boat, along the 1000-km Kara Kum Canal?

No, do not destroy the desert with your hands. It must be protected and preserved. There is no other way. The desert does not tolerate disrespect for itself, but is fierce and indomitable in its wrath. If you disturb the turf blanket which covers the soil, the revitalized black sands rush to an attack on the villages, the fertile fields and the railroad.

Industrial assimulations of the Kara Kum faces this problem with special severity in the order of the day. The high-power technology which was used in laying pipelines, electric-power lines and highways disturbed the vegetation cover. The roads to different facilities and buildings became covered with drifting sand as thick as a kilometer. A gentle wind put the sands into motion and a wind of 7-10 meters/second produced dust storms. In Nebit-Dag, we were told that on a section of the railroad, 1-1/2-km branchline, a special mechanized detachment which removed the drifts from the steel tracks was employed. This costs hundreds of thousands of rubles annually. In Gaz Achak we heard that when they laid the Central Asia Center gasline, the wind not only uncovered the pipes but also blew away the sands under them causing them to sag. Extreme measures suggested by scientists specializing in the study of the desert were required to save the pipeline.

Water is life in the desert. However, even the Sumerians who lived several thousands of years ago knew that an excess of moisture on the fields is no less a calamity than a shortage of it. Oversoaked soil here turns into a salt marsh. Over the course of many centuries, water shortages in Central Asia prevented excessive overflooding and the salination process proceeded slowly. Today we are water rich, and kolkhozes and sovkhozes have stopped using water wisely, using it at rates of 2 or even 2 1/2 times above the norm.

Irrigation water losses from canals are vast. Say that, in the Khauz-Khan massif, up to 30 percent and even more is lost underground. It disappears without a trace; the water table level drops, which means the bogging up and salination of large areas. Collector-drainage systems intended for removal of mineralized moisture from the fields are producing salt marshes. Now it is being discarded in old, dry river beds, depressions in the sands. The lakes forming there lower the water table level, and then they dry up, forming salt marshes. The salt accumulating here is carried onto the fertile fields by the wind.

This evil can be prevented, especially, by the introduction of trickle irrigation, during which the water is fed directly to the plant roots. However, this progressive method is being assimilated slowly in the republic, and experiments are being conducted only on 500 hectares.

There is no good physical reason for this, says Deputy Minister of the Turkmen SSR Ministry of Reclamation and Water Economy A. Ovezov. There is not enough pipe or trickling filters. We must construct a special enterprise. Moreover, scientists have not solved all problems of the trickle method. Herein, in my opinion, the efforts of Central Asian scientists must be united.

Among the most important problems facing desert specialists are timely foresight in respect to undesirable consequences of encroachment against desert life and the implementation of measures to prevent them, to begin quickly to heal the wounds already inflicted and to find new methods of cautious and certain complex development of the desert.

Scientists have already done much. Methods of controlling the shifting sand dunes have been developed and are being used in practice. Scientists are sowing drought-resistant plants; they are soaking the sands with chemical bonding agents, they are covering it with shields. In southwestern Turkmen alone, 20,000 hectares of sand dunes are being secured. Green belts are being raised around towns and protective forest belts are being placed on fields. Scientists have proposed a rational system of exploitation and improvement of irrigated desert pastures and placement of new, nonirrigated pastures. Expenditures on these repay themselves in 2-4 years.

Takyry was always considered to be a dead land. However, associates of the Desert Institute demonstrated that even this land can be made to bear fruit even without irrigating. To achieve this a double row of furrows is laid along the slope of the takyry. The upper furrow collects precipitation and feeds the mositure downward where fruit trees, grape vines and melons are planted. Experiments under production conditions showed the high profitability of this system of agriculture.

The desert experts propose the practice of many other innovations. Planting shrubs on pastures means additional fodder and protection from the wind. There are being developed methods of producing high yields of different crops after single irrigation of the moving sand dunes.

The scientists have important and interesting ideas. Reduction of evaporation of reservoirs, development of small, economical sprinklers are being considered. There are plans to harness the energy of the sun and wind for the service of man, to master a method of irrigation with brackish waters. It is calculated that the use of mineralized moisture for watering feed crops will save 15 percent of the fresh water.

A very vital question is the use of judicial and economic levers of environmental protection and the improvement of propaganda concerning the knowledge about nature protection. Tangible damage is inflicted on the desert, for example, by oil-industry workers and gas extractors, highway builders and pipeline builders. The soil disturbed by them sometimes cannot heat its own wounds. Scientists have proposed many times the use of economic sanctions in these cases, the levying of assignments for forest reclamation. Alas the suggestions are not heeded. In a republic 4/5 of which is desert, there are still not developed restrictions involving economic mastery of the desert. The concern of the scientist is genuine. Such measures are necessary. They will prevent severe stresses on the desert and make it more generous and hospitable.

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WATER PURIFICATION FACILITIES AT VOLZHSKIY DESCRIBED

Moscow PRAVDA in Russian 28 Jan 80 p 7

[Article by R. Fedorov: "Liman Became a Customer"]

[Text] In Volgograd Oblast, in the sun-scorched Akhtuby reservoir, there is a green nook which, perhaps, may even be called heavenly. In summer among the picturesque, verdant reeds in the lake, many flocks of ducks graze, white female swans swim and long-legged herons roam knee-deep in the water. Deer and wild-boars inhabit the banks. Some time ago, the Regional Executive Committee declared this area to be a State Game Preserve.

It is a man-made lake. It is now called Bolshoy Liman. The designer's sketch designated it simply as an evaporation reservoir. This is the last link of one of the streams of the purification installations of the Volzhskiy Industrial Complex (the Rostov branch of the "Soyuzvodokanalproeyekt" Institute designed them). These were constructed so that Volzhskiy (a town of more than 200,000 people with major enterprises, including chemical and petrochemical enterprises which use large quantities of water) does not release a single liter of polluted effluents into the river.

Three turbid flows pour into the closed water purification system. This is primarily the industrial and domestic drainage of the town itself and from the industrial complex. After passing through capacious complete biological purification installations, the water is placed on the fields of two sovkhozes and, in winter time, is stored in holding ponds.

Another stream of highly polluted industrial effluents from the industrial complex passes into air tanks for biological purification, where bacteria purify the water. The clarified water, almost totally free of impurities, flows into Bolshoy Liman, the reservoir-evaporator. Here, the water vegetation, the reeds and reedmace perform the final purification. The sazan and the bream, which are being bred in the lake, indicate conclusively the quality of the water.

A third flow consisting of industrial water slightly polluted by chemicals is not directed into air tanks for biological purification; they enter a canal, the channel of which is planted with reeds and reedmace also. We must specify that not only grasses purify the water here. Microbial slime (periphyton as biologists call it), covering the underwater part of the stalks, play an important role. Therefore, this process continues in winter when the plants "sleep." After traversing the 7-kilometer course of the canal, in a period of 9 hours, the water becomes so pure that it may be returned to the industrial water supply system.

Volzhskiy is growing. Construction is continuing and enterprises of the industrial zone are expanding. However, the plants do not increase the water intake from the Volga. Installation of a 4th stream was designed and is being erected. Domestic and industrial effluents from the blocks of new buildings, after passing through a biological purification installation are being used for technological needs.

The discharge-free systems of the Volzhskiy Municipal water economy and its industrial network, comments deputy director of VNIIVODGEO [All-Union Scientific Research Institute of Water Supply, Sewer Systems, Hydraulic Engineering Structures and Engineering Hydrogeology] Candidate of Technical Sciences V. N. Shvetsov, is unparalleled in respect to many of its features. The correctness of the design decisions made concerning it, is confirmed by the practice of operation of the installations constructed and the accident-free operation of the entire system. It may well become an example for other towns of the Volga Basin, and, perhaps, even beyond. The recycling of water for industrial needs is becoming a duty of these times.

Meanwhile, we are trying, with great difficulty, to overcome a psychological barrier, that is, the habit of industrialists to prefer only "pure" water from natural sources, says Doctor of Technical Sciences L. A. Alferova, director of the Laboratory of Closed Systems. Of course, the recycled water system obliges them to maintain the necessary order in their own shops. You know it is necessary for example, to allow for the fact that one outside installation of the system in Volzhskiy cannot guarantee adequate purification of industrial waste waters. Purification devices within the plant and within shops play an important role here. At the same time, they permit saving or repeated use of many substances which are being used in a production process and of raw material. The strict observance of technological discipline, great care during production are also quite important. All of this is necessary. Recycling circuits assist not only in maintaining the purity of rivers and lakes but also save resources and material and labor reserves.

However, neither designers nor scientists consider the good water economy system of Volzhskiy to be the peak of perfection. There is room for improvement, they assume, and they continue the search. Not everything, however, depends upon them alone. What worries "Soyuzvodokanalproeyekt" director Yu. N. Andrianova is active sludge, that is, a combination of bacteria, Protozoa and other microorganisms. Absorbing the pollutants, they grow rapidly on this "food." Methods must be found to utilize the excess numbers of them. Scientific studies show that the protein mass of microorganisms, which purify effluents from yeast-hydrolysis production and from swinery complexes may provide feed additives for cattle. A technology for producing them has been developed, but the required equipment is not yet available. Active sludge which purifies other effluents by removing different kinds of harmful components provides good initial raw material for producing generator gas, absorbents--sorbents. However, this requires multi-hearth furnaces and they are not yet being manufactured.

Meanwhile, in addition to use of the active sludge, it would be possible to use part of the town's refuse.

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LIDARS USED TO MONITOR AIR POLLUTION

Moscow IZVESTIYA in Russian 13 Mar 80 p 3

[Article by I. Samokhvalov, head of laboratories at the USSR Academy of Sciences, Siberian Department, Institute of Optics of the Atmosphere: "Reliable Sentries"]

[Text] The Law on the Preservation of Atmospheric Air provides the basis for a strategy of systematic and consistent air pollution control. It outlines a system of measures ensuring elimination of black, grey and yellow streams in the air over industrial sites and plants. The sky, in spite of the statements of some industrial executives, still is not bottomless and for each of us is, after all, rather limited.

As a specialist, I know that observance of this law now under discussion guarantees, among other factors, an adequate industrial base. It is constantly being reinforced and improved. The resources required for this are being allocated generously. Methods of remote monitoring of the atmosphere by the use of lasers is being developed by the efforts of some academic and sectoral institutes, the USSR State Committee on Hydrometeorology and Control of the Natural Environment. The advantages of laser sounding are an increased number of simultaneously obtained parameters, accuracy and operational efficiency of analysis and the great area covered by it.

A laser locator, a lidar, is being developed and prepared at our institute and at the special design bureau "Optika" under the direction of V. Zuyeva, corresponding member of the USSR Academy of Sciences. The lidar is intended for monitoring air pollution by industrial aerosols. The device works on a simple principle. The transmitted laser light pulse is scattered and some of it is reflected from particles of pollutants. Special devices trap the reflected signal. The time of passage of the pulse and its magnitude determine the distance to the aerosol accumulation and its concentration. The entire measurement requires only fractions of a second. Changing the direction of the sounding, it is easy to determine the dimensions of the field of particles. It is possible to detect local sources of pollution and trails of them.

We first used lidars in 1972 in Zaporozh'ye during a complex power experiment. Data concerning the intensity of pollution of the air basin were collected, the altitude and the dynamics of spreading of the aerosols under different meterological conditions were evaluated. The studies showed a drastic effect of weather on the natural ventilation of the town. Therefore the upper boundary of the "cap" varied from 0.5 to 2 kilometers. There is no doubt that our results were useful to design organizations and economic organizations.

We collaborated with Leningrad Mining Institute specialists in Zapolyarnyy in some interesting research. A lidar instantaneously and accurately determined the pollution in open pits of "Pechenganikel'" Combine and checked the operation of the ventilation systems. Lasers, in this case, served as actual sentries of health. They prevented excesses of dust after explosions and during intensive operation of mechanisms. As a result, necessary preventive measures were taken. Lidars were used for the study of the atmosphere in other industrial centers of the country. A laser probe of the atmosphere over Sofia was conducted in collaboration with Bulgarian scientists. The results obtained were totally practical.

Last summer a group of lidars from our institute and the Central Aerological Observatory were used for a survey of the purity of the air basis over Moscow. The studies were conducted in preparation for the Olympic games.

The output of one of the Tomsk lidars is being assimilated by industry. The first devices for determining the aerosol pollution level in the air already are issued. This means that the arsenal of sentries of the atmosphere has been armed with new modern devices. However, they are still being used inadequately. That is why, while approving the "Law on the Preservation of Atmospheric Air" as a whole, I suggest the addition in Article 11 (after the first proposal) the words "For the purpose of timely detection and prevention of violations of the established norms of emissions of pollutants; enterprises which could produce such pollution must be equipped with devices for operational monitoring of the qualify of such emissions."

I suggest no other changes.

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USSR

HURRICANE CAUSES EXTENSIVE DAMAGE IN TADZHIKISTAN

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 4 May 80 p 1

[Article: "Immediately Following the Disaster"]

[Text] A real hurricane descended on the Gissarskaya Valley on the evening of the first of May. Gale-force wind and hail damaged cotton crops, vineyards and orchards on farms in the Leninskiy and Gissarskiy rayons. Electric power transmission lines, some residential buildings and production buildings were damaged. Fortunately, there were no human casualties.

At the request of a TadzhikTA correspondent, the first secretaries of the Leninskiy and Gissarskiy raykoms described measures taken to clean up after the natural disaster.

"Every spring, torrential flows cause considerable damage to rayon farms," stated S. Khavizov, first secretary of the Leninskiy Party Raykom. "Foreseeing this, we built a four-kilometer canal that collects overflows and carries them away from structures and crops. The canal did its job this time as well. However, the disaster was of such a magnitude that the measures taken have not been effective everywhere. In places, the wind and hail damaged the young cotton plants. Vegetable crops suffered on the Irkutsk Sovkhoz. In some places, the hail literally leveled the lucerne and annual grasses. Here and there, production structures were damaged. A poultry farm was destroyed on the Moscow Kolkhoz.

A special clean-up commission is ascertaining the scope of the damage and is helping all enterprises, kolkhozes and sovkhozes to resume normal operation. We immediately felt a great deal of help from the Central Committee of the Communist Party of Tadzhikistan, the republic government, and a number of ministries and departments. The laboring life of the rayon is returning to normal. Dining establishments and stores are operating according to their usual schedule and the population is supplied with everything it needs.

Our paramount task is to restore the cotton plantings. Machinery and seed are concentrated on the fields that are slated for re-seeding. We plan to carry out this work in an extremely short period of time. Our farmers are experienced cotton-growers. They will try to produce a high yield on the re-seeded fields and to fulfill pledges adopted for the final year of the five-year plan.."

"The disaster did not bypass our rayon," stated U. Aloviddinov, first secretary of the Gissarskiy Party Raykom. "Our crops, our irrigation network, and the kolkhozes imeni Karl Marks and imeni Zhdanov also suffered from the torrential rain, mud flows and hail.

But the rayon's work force was highly organized in the face of the disaster. Measures are being taken to restore plantings, canals, roads, and housing. The entire rayon helps those who have suffered. Thus, the kolkhozes imeni Kalinin and the 22d Party Congress have allocated the necessary machinery and people needed to re-seed cotton on the kolkhozes imeni Karl Marks and imeni Zhdanov. Re-seeding operations will be carried out quickly and competently. The rayon's work force is confident that it will overcome all difficulties and will meet its socialist commitments.

Friendship and mutual aid are now felt literally every step of the way. Building repairs commenced without delay. No one will be left without a roof over their head. Intensive repair work is in progress on the irrigation network, on the roads, and on production structures. Crops, orchards and vineyards continue to be tended. Farmers everywhere are trying to produce a high yield. The rayon's working routine has not been disrupted.

Clean-up measures are being taken everywhere in the Gissarskaya Valley. Blue collar workers, kolkhoz workers and specialists are working intensively.

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FERTILIZERS AND THE ENVIRONMENT

Moscow SEL'SKAYA ZHIZN' in Russian 18 Apr 80 p 2

[Article by V. Kovda, corresponding member, USSR Academy of Sciences; V. Kudeyarov, candidate of agricultural sciences; and V. Bashkin, candidate of biological sciences]

[Text] The years of the Tenth Five-Year Plan have been noteworthy for the further growth of production and application of mineral fertilizers throughout the nation. In 1979 alone, 94.5 million tons (in standard units) of mineral fertilizers were produced. Now many regions have become zones of intensive agricultural chemicalization and fertilizers are a powerful factor in increasing the fertility of the soil. With the able use of mineral and organic fertilizers, previously infertile land becomes highly productive.

There is practically no zone or soil in our country where fertilizers would not increase the yield and improve quality. It would be possible to cite hundreds of examples of their highly effective application under production conditions. However, the mighty flow of chemicals into agriculture cannot but affect the natural processes that are associated with the biological cycle of elements participating in plant and animal nutrition. These elements are customarily called "biophilic."

Soil fertilizers primarily contain such elements as nitrogen, phosphorus and potassium since these are the elements the plants need most. All soils contain various forms of nutrient elements in greater or lesser quantity. Thus, small applications of fertilizer (less than 100 kilograms of active substances per hectare) do not substantially alter either the reserve of nutrients in the soil or their properties as such.

However, the regular application of much higher quantities of fertilizers can seriously disrupt the natural nutrient cycle. Such disruptions are especially possible in individual regions of intensive agricultural production, i. e., on cotton-sowing, beet-sowing, vegetable-sowing, and rice-growing farms and in the suburbs of large cities. These zones are also frequently the focal point of large concentrations of livestock in a limited space, which leads to the accumulation of large quantities of manure and to agricultural runoff.

In order to evaluate the influence of chemicalization on environmental pollution, it is necessary to observe the various ways in which nutrient elements from the soil are discharged into various bodies of water which essentially are the ultimate medium in which soluble matter accumulates.

When biophilic elements, especially nitrogen and phosphorus, enter bodies of water they cause eutrophication of the latter. "Eutrophication" is the term that denotes the process arising when substances generating the growth of aqueous vegetation and microorganisms enter the water. The primary reference is to nitrogen and phosphorus. Eutrophication is also caused by other macro- and microelements, organic hydrocarbon compounds (probably most important for increasing the growth of microorganisms), and growth stimulants (heteroauxins).

Until recently, the eutrophication of bodies of water resulted primarily from the erosion of cultivated land and the wash-out of nutrients from the soil. Without nutrients, natural waters become lifeless, aqueous plants are unable to grow, and fish do not find sufficient food to live on. Without a normal influx of biophilic elements in times past, water and swamp plants, plankton, and benthos would not have been able to develop and this would have precluded the formation of coal, oil and gas. In some cases, bodies of water are even artificially eutrophied in order to intensify pisciculture. However, at the present time human economic activity has in many regions intensified eurotrophic processes: excessive contentrations of hydrocarbons, nitrogen and phosphorus are having adverse consequences.

In such highly polluted bodies of water, there is more intensive efflorescence which causes algae to die or rot. In these bodies of water, an acute shortage of oxygen is accompanied by the generation of methane gas and hydrogen sulfide. As a result, fish and other water animals die and the water becomes unusable for household use.

Nutrients are washed out of the soil with varying degrees of intensiveness. Soil phosphate and potassium compounds like phosphorus and potassium in fertilizers are washed out of the soil in relatively small quantities. Nitrates are washed out to a much greater degree. All forms of nitrogen fertilizers pass through a formative stage. Where water circulates through the soil, nitrates are washed out even from soils with a heavy mechanical composition. The most undesirable consequence of this is their contamination of potable water. Given their high concentration (over 40 milligrams per liter), the prolonged consumption of such water can have extremely negative consequences.

The moderate application of nitrogen fertilizers to most agricultural crops leaves practically no residue of nitrogen fertilizer in the soil at the end of the growing season that could wash out and contaminate the subsoil water. The losses of nitrates are usually high when the quantity of nitrogen applied significantly exceeds the plants' intake. Thus, a grain harvest of 25-30 quintals takes approximately 60 kilograms of nitrogen out of the soil;

150-200 quintals of potatoes takes 80-90 kilograms of nitrogen; and 500-600 quintals of cabbage take 70-80 kilograms of nitrogen out of the soil. Even when natural losses and fixation in soil humus are taken into account, it is frequently not expedient to apply more than 120-150 kilograms of nitrogen per hectare to all these crops.

Unfortunately, mineral fertilizers are frequently misused and several times more fertilizer is applied than is used by the plants. For example, a number of Moscow Oblast farms have for several years applied 150 kilograms or more nitrogen fertilizer per hectare on the average and have applied 400-500 kilograms of nutrients combined. Such dosages are economically unjustified and are simply undesirable from the standpoint of environmental protection.

The Institute of Soil Science and Agrochemistry of the USSR Academy of Sciences has for more than a single year been conducting observations in the upper part of the Oka basin on the content of biophilic elements and especially of nitrogenous compounds. It studies various bodies of water in connection with the growing use of mineral fertilizers on the fields of this region. For example, on farms of the Zaokskiy Rayon of Tul'skaya Oblast, grain, potatoes, corn, and grasses (to which between 50 and 150 kilograms of active nitrogen fertilizers are applied) are the principal crops involved in the crop-rotation scheme. A comparative study was made of the nitrogen balance there in 1967 and 1977-1978. And while in 1967, fertilizer accounted for 37 percent of the nitrogen, 10 years later, it accounted for approximately 70 percent of all nitrogen.

Owing to the rapid chemicalization of agriculture in the Non-Chernozem Zone, the application of nitrogen fertilizers in the Zaokskiy Rayon increased more than fivefold in the space of 10 years. But unfortunately, this growth has not always and everywhere been accompanied by a corresponding increase in crop yield. As a result, the nitrogen balance changed from negative (when its consumption by crops considerably exceeded the amount supplied by mineral and organic fertilizers) to positive during those years. Thus, the concentration of nitrates in the subsoil water of the Zaokskiy Rayon was increased more than sixfold. And even though the maximum permissible concentration of nitrogen nitrate is not observed there, an increase in its content in subsoil water compels us to approach this problem more seriously.

The growth of deliveries of mineral fertilizers to agriculture must necessarily be accompanied by better fertilizer application equipment, by the construction of warehouses, and by the more sophisticated handling of mineral fertilizers. It is particularly important to calculate fertilizer dosages properly and to observe scientifically substantiated proportions of nitrogen and phosphorus. The application of unjustifiably high dosages of mineral fertilizers, especially nitrogen fertilizers, is economically unjustified and ecologically harmful!

The use of slow-acting, capsulized nitrogen fertilizers that are gradually absorbed in the soil and in plant nutrition processes might appear to be promising in irrigated regions. Inhibitors -- substances that impede this process -- can be recommended to reduce the nitrification of ammonium fertilizers. Unfortunately, industry does not as yet produce them even though the need for these substances is great. Post-harvest and post-haying crops, which effectively use the residues of nitrogen fertilizers, are an effective means of intensifying agriculture and of improving the use of applied fertilizers by plants. In the case of row crops, it is desirable to use dense sowings to this end. The alternation of intensive with less intensive crops can also prevent losses of the excess of nutrient substances applied together with the fertilizers.

The reorganization of the country's agrochemical service and the creation of agrochemical centers will open up new possibilities for making more effective use of mineral fertilizers and will permit their better storage, shipment and application.

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BRIEFS

MEETING OF CONSULS GENERAL--(RATAU)--On 28 March the Protocol Department of the Ministry of Foreign Affairs of the Ukrainian SSR organized a meeting of consuls general of socialist countries in Kiev with K. M. Sytnik, academician of the Academy of Sciences of the Ukrainian SSR; vice-president of the Ukrainian Academy of Sciences. He briefed the leaders of consulate institutions on the scientific research effort of republic scientists in the realm of rational natural resource utilization and environmental protection and on their participation in international cooperation on these problems. [Text] [Kiev PRAVDA UKRAINY in Russian 29 Mar 80 p 3] 5013

MUD DAMS IN ALMA-ATA--Alma-Ata--Industrial enterprises, transportation arteries, and residential areas in the western part of the capital of Kazakhstan have nothing more to fear from rock-and-mud flows. They are reliably protected against the menace that is generated high in the mountains by an enormous dam that shields the Bol'shaya Almaatinka River Valley. The last cubic meters of concrete have been placed in the body of the dam. The effectiveness of such structures in controlling mud flows has been proven long ago. The rock-filled dam in the vicinity of Medeo, the world-renowned high-altitude skating rink, not so long ago withstood a mudslide weighing millions of tons. Residential quarters, sports facilities, and recreational areas were saved. Both dams are part of a complex that protects the city from mudslides. They supplement smaller reinforced concrete barriers to the principal mud-flow routes. Hydrotechnical systems have been set up near the edges of glaciers. Placed in permafrost soil with the aid of low-intensity explosions, they channel excess water down to the rivers. [Text] [Moscow IZVESTIYA in Russian 14 Mar 80 p 3] 5013

VOLCANIC ACTIVITY IN AZERBAIJAN--Baku, 31 [Mar] (TASS)--Lokbatan, the most active mud volcano in Azerbaijan, made itself known by underground tremors recorded by a seismic station and by a pillar of flame. Scientists arriving today at the site of the eruption watched as the volcano, surrounded by fire and steam, hurled sandstone to a height of 15 meters into the air. Commenting on this natural phenomenon, B. Grigoryants, head of laboratory, Institute of Geology of the Azerbaijan Academy of Sciences, noted that Lokbatan, which had been characterized by cyclical eruptions for a half-century, had become considerably more active of late. Its crater is covered with rock expelled from the interior which has formed a plug. This may lead to new eruptions. [Text] [Moscow PRAVDA in Russian 1 Apr 80 p 6] 5013

TYPHOON IN CHITINSKAYA OBLAST--Chita--Chitinskaya Oblast is successfully cleaning up after an extremely powerful cyclone. Weather satellite and ground weather station data indicated the formation of an unusually deep and vast cyclone in the southeastern Transcaucasus. In Chita, the party obkom set up a headquarters to deal with the oncoming typhoon. The radio broadcast storm warnings to all corners of the vast kray and advised farms, especially livestock farms, on how to withstand the storm. The first torrential squall broke upon the land on 17 April. It particularly threatened the sheep pens in the Aginskiy Buryatskiy Autonomous Okrug and in the Akshinskiy, Kyrinskiy, Ononskiy, Aleksandrovo-Zavodskiy, and Shilkinskiy rayons. People did their utmost to protect the lambs against the squall. The next day brought a hurricane of snow. Wet snow raced over the steppe at a speed of 20-25 meters a second. Electric power transmission lines and some production and residential buildings were damaged; communications with many populated points were disrupted. The steppe was next subjected to chilling winds. The ground was covered with an icy shell. The farms activated automatic feeding systems. Temporary communication lines were set up. Tractor-trains hauled feed to cut-off flocks and herds and Chitaenergo repair teams started work on damaged sections of electric power lines. [Text] [Moscow IZVESTIYA in Russian 22 Apr 80 p 6] 5013

EARTHQUAKE IN KIRGIZIYA--Frunze (TASS)--An earthquake of 5-6 point intensity at the epicenter occurred on 19 March at 0342 hours(Moscow time)in Kirgiziya. According to the Institute of Seismology of the Academy of Sciences of the KiSSR, the center of the earthquake was 70 kilometers southwest of the town of Naryn. Here and in nearby settlements the intensity of the earthquake was perceived to be 4-5 points. There was no injury to people or damage to structures. [Text] [Moscow IZVESTIYA in Russian 20 Mar 80 p 6] 5013

ENVIRONMENT, ECONOMIC DEVELOPMENT SEMINAR--An international regional seminar on "The Environment and Economic Development" continued in Moscow. The seminar is conducted by the UN Institute on the Development of Asian and Pacific Countries and Higher Economic Courses under the auspices of USSR Gosplan in support of the UN Environmental Program. Twenty-six representatives of government and state organizations from various countries are taking part. The seminar examines questions associated with the rational utilization of natural resources and the implementation of nature conservation measures in the process of economic and social development. Seminar participants showed keen interest in the Soviet Union's experience in planning the rational utilization of natural resources, their conservation and reproduction (while maintaining the dynamic development of the socialist economy) and in the results of collaboration of CEMA member nations. The seminar's program also includes a visit by its participants to Uzbekistan where they visited kolkhozes and sovkhozes in the Golodnaya Steppe and studied land irrigation, cultural and consumer services, the use of local raw materials in the production of consumer goods, and other questions associated with the conservation and rational utilization of the environment. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian 17 Apr 80 p 7] 5013

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NONIONIZED ELECTROMAGNETIC RADIATION HAZARDS DISCUSSED

Rome RIVISTA MARITTIMA in Italian Apr 80 pp 55-65

[Article by Giuseppe Mataluno and Giovanni Spinelli: "Electromagnetic Pollution"]

[Text] Introduction

Generally, when one speaks of pollution, images come to mind of beaches littered with plastic trash, seas black with oil, the yellowish fumes of industrial emissions and cities blanketed with smog, but attention is never directed to another form of environmental degradation that one does not see because it is invisible and of which little or nothing at all is spoken: electromagnetic pollution.

In the last quarter-century there has been enormous growth in the use of electronic equipment and apparatuses that emit a wide variety of nonionizing radiant energy in the form of ultraviolet rays, visible light, infrared rays and radiofrequency waves (all classified as electromagnetic waves) which, when they exceed certain levels of power and duration of exposure, produce various kinds of injury to the human organism. We said "nonionizing" energy because these are radiations that by their nature cannot cause disintegration of atoms in the same way as X-rays and gamma rays, which are called "ionizing" precisely because of their ability to produce ions. In the following pages, we shall first concern ourselves with the polluting effects on human beings of the radiofrequency waves, and in particular, that portion of them that go by the name of microwaves, inasmuch as they are the electromagnetic radiations in most common use on board naval vessels; then, because of their constantly growing use for naval purposes, we shall go into some detail on lasers, the emission of which in electromagnetic waves is related principally to the infrared-ray portion, with extension to the zones of the ultraviolet rays and visible light.

The Dangers of Electromagnetic Waves

Many of the electromagnetic energies, at certain frequencies, levels of power and durations of exposure can produce biological effects or damage that depend on different physical and biological variables. Radiant energy can have an effect only when it is absorbed, keeping it in mind that its principal modes of action are of a photochemical and thermal character. Photochemical reactions occur especially in the ranges of visible light and the ultraviolet, while the thermal effects are produced essentially through absorption of the energy associated with the infrared rays and the radiofrequency waves. Before speaking of the specific effects of exposure to microwaves and lasers, it should be recalled that high temperature of the human body can cause denaturation of proteins, increase in the permeability of the cell membranes, freeing of toxins, decrease in enzyme activity, and various other changes. At the temperature of 41° C, the central nervous system may not function normally, and states of protration, coma, and at the limit, death, may result.

As regards exposure to microwaves and lasers--the subject of this article--the resultant increase in body temperature depends on the following factors:

(1) the specific area of the body surface exposed and the efficiency of heat elimination;

(2) the intensity of the electromagnetic field;

(3) the duration of exposure;

(4) the specific frequency or wavelength;

(5) the thickness of the skin and of the subcutaneous tissue.

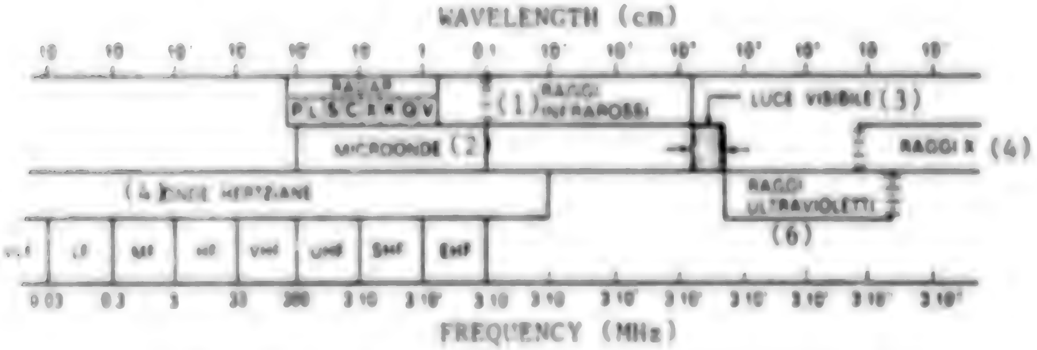


Figure 1. Spectrum of the Electromagnetic Waves

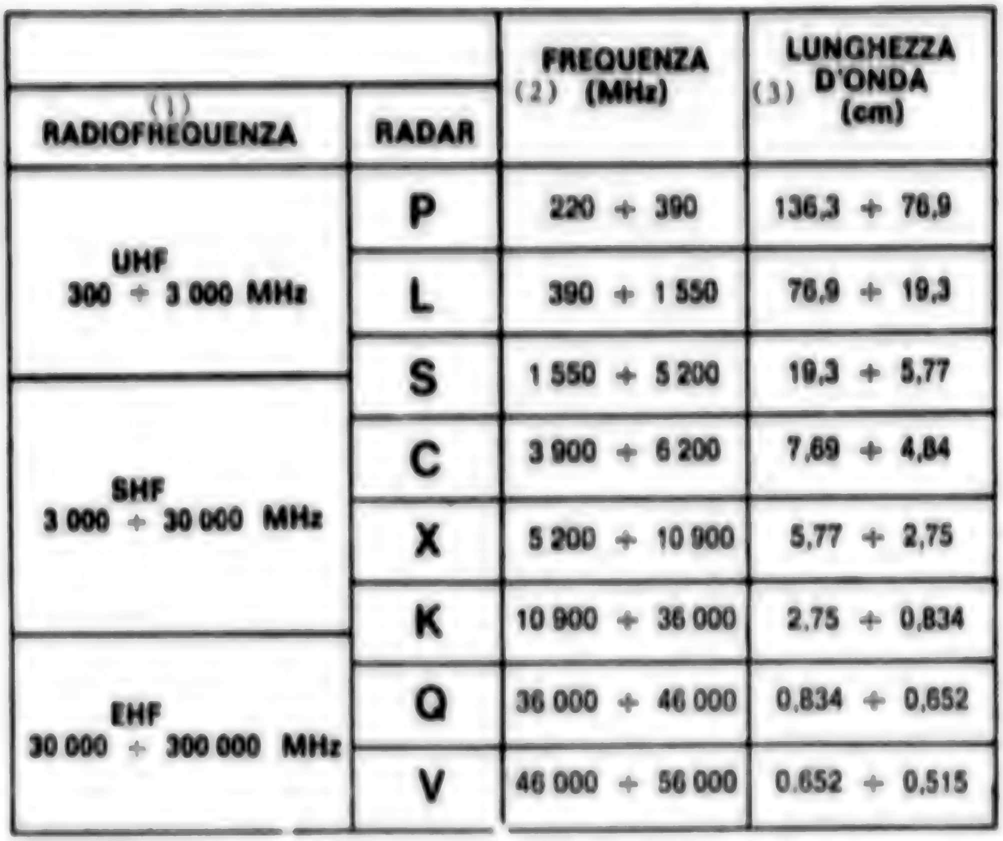
Key:

1. Infrared rays
2. Microwaves
3. Visible light
4. Hertzian waves
5. X-rays
6. Ultraviolet rays

The Microwaves

Hertzian waves, or radio waves, propagating in space, are considered a radiant form of energy, like light and heat. From the practical point of view,

Table 1. Frequency Bands of the Microwaves



(1) RADIOFREQUENZA	RADAR	(2) FREQUENZA (MHz)	(3) LUNGHEZZA D'ONDA (cm)
UHF 300 ÷ 3 000 MHz	P	220 ÷ 390	136,3 ÷ 76,9
	L	390 ÷ 1 550	76,9 ÷ 19,3
SHF 3 000 ÷ 30 000 MHz	S	1 550 ÷ 5 200	19,3 ÷ 5,77
	C	3 900 ÷ 6 200	7,69 ÷ 4,84
	X	5 200 ÷ 10 900	5,77 ÷ 2,75
EHF 30 000 ÷ 300 000 MHz	K	10 900 ÷ 36 000	2,75 ÷ 0,834
	Q	36 000 ÷ 46 000	0,834 ÷ 0,652
	V	46 000 ÷ 56 000	0,652 ÷ 0,515

Key:

1. Radiofrequency 2. Frequency (MHz) 3. Wavelength (cm)

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the radiofrequency spectrum extends from 0.01 to 300,000 MHz and is subdivided into different bands codified variously, in accordance with their use, as is shown in Figure 1. The term "microwave" is applied to that portion of the radiofrequencies between 300 and 300,000 MHz (corresponding to wavelengths between 1 mm and 1 m), which, from the functional and operational point of view, are subdivided into the so-called RF or radar bands as shown in Table 1. The energy of the microwaves, when propagated, is characterized by two discrete modes known as CW (continuous wave) and impulsive. CW is generally associated with transmitters for radio communications, while the impulses are related mainly to radar. Such waves are normally produced by means of particular valves such as magnetrons and klystrons, whose electron beams, accelerated by differences of potential on the order of 10 kV, are used to excite electromagnetic oscillations in resonant cavities. As regards radar, in order to judge the degree of dangerousness of the electromagnetic radiations emitted by them, it is useful to clarify what happens with the radiofrequency energy produced by the apparatus once it has left the antenna. Figure 6 shows in a qualitative manner that in the vicinity of the antenna, in the area known as the Fresnel zone, power remains nearly constant with distance and is contained within a beam of the same dimensions as the aperture of the radiator. The distance within which the above statement is valid is given by the relation

$$R_{FRESNEL} < \frac{1}{4}\frac{D^2}{\lambda}$$

in which R is the distance from the antenna, D is the dimension of the antenna aperture, and λ is the wavelength. Beyond the Fresnel region, the beam opens up and the power decreases with the distance, in accordance with the well-known law of the inverse of the square. The distance at which this law starts to govern is the beginning of the Fraunhofer region, and is given approximately by the relation

$$R_{FRAUNHOFER} > \frac{D^2}{4} .$$

In any case, the relation between the wavelength of the radiofrequency energy and the physical dimensions of the objects exposed to such energy is of capital importance in dealing with the problem of its biological effects and therefore of those of the microwaves also.

It has been determined, in fact, that in order for significant effects to occur, the dimensions of the object must be equivalent to at least 1/10 of the radiation wavelength. Table II gives several values of frequencies, wavelengths and wavelength numbers represented by a man 1.6 meters tall and easily deduces from them that with increase of the radiation frequency, this man, in height, represents a larger wavelength number and vice-versa. It can be said generally that if a person in general is considered as a sort of vertical receiving antenna, his electrical length depends on the radiation frequency, and the probability that biological effects appear increases with the increase of this frequency. In addition, with decrease in wavelength, the dimensions of the various parts of the body become progressively significant in terms of equivalent wavelength numbers.

On the premise that the human body is composed of various tissues that present the characteristics of a complex (the first stratum is composed of the surface tissues of the skin; the second stratum is the fatty tissues under the skin; the third stratum is the central mass of deeper tissues such as the muscles, which are tissues of high water content; and then comes the bone structure), when electromagnetic waves meet, in their way, a discontinuity of the medium of propagation, as in passing from air to a human body, their speed is modified in such a way that their electrical length becomes shorter than that of air. Thus, for example, the wavelength of an electromagnetic radiation in a human tissue can alter to half what it was in air, and therefore, at a frequency of 2,500 MHz, a tissue 1.5 centimeters thick represents the equivalent of 1/4 of the corresponding wavelength. In this way there is a sort of impedance matcher, as between the air and the tissues, of the quarter-wave type. Consequently, at certain frequencies the thickness of the skin and of the fatty tissues, functioning as a perfect matcher, permits transfer of radiant energy into the human body in a quantity that is in function of the higher or lower quality of this matching and can go as high as 100 percent.

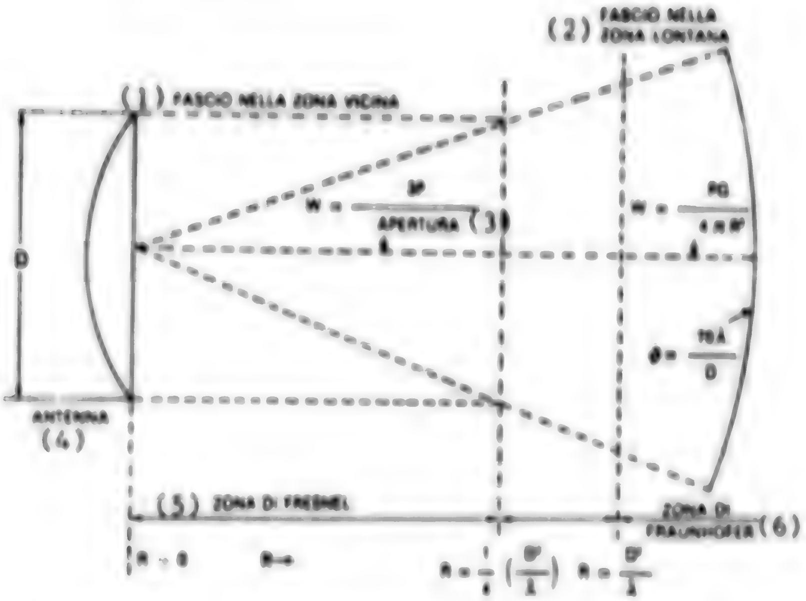

Figure 6. Distribution of energy in a radar beam

Key:

1.	Beam in the nearby zone	4.	Antenna
2.	Beam in the distant zone	5.	Fresnel zone
3.	Aperture	6.	Fraunhofer zone

Table II. Table of Comparison (Height: 1.70 m)

Frequency	Wavelength		Equivalent Wavelength
(MHz)	(meters)	(cm)	Number
3	100	10,000	0.017
30	10	1,000	0.17
300	1	100	1.7
3,000	0.1	10	17
10,000	0.03	3	56.6

As regards the type of biological injuries, then, and their mechanism of action, we can be consider in the first place the so-called thermal effects connected with absorption of energy, of which we spoke above, with consequent increase in the temperature of the human body. The possibilities of damage of specific parts of the human body depends on the quantity of energy absorbed and also on the possibilities for dissipation of the heat produced. In evaluation of the consequent risk, account must also be taken of the importance of the organs that may be damaged. Among the thermal effects, special attention has been given to the eyes, in which cataracts may be produced, and to the male reproductive system, which can suffer temporary sterility or degenerative alterations. Alterations of the cell opoulation of the blood and cases of mongolism, in statistically significant numbers, have also been observed among the children of persons exposed to the microwaves generated by radars, probably through alterations of a genetic kind arising in the persons exposed. From studies conducted on the subject, especially in the eastern countries, but not yet universally accepted, there is also the possibility of biological effects on the nervous system, recurring headaches, or abnormal lowering of the heartbeat rate, even from modest levels, on the order of tenths of a mW per cm^2.

In the present state of affairs, considering the fragmentary character and the uncertainty of the knowledge about the possible biological injuries resulting from microwaves, the maximum exposure levels fixed in some states by the legislature, or in many cases, by private organizations interested in the problem, are normally based on the intensity of the density of flux of the microwaves and do not make distinctions among the various frequencies. While in the western countries a limit of 10 mW/cm^2, estimated on the basis of the studies so far conducted on thermal effects, is generally accepted for continuous exposure of the operators and repairers of microwave apparatuses, the countries of East Europe go as low as values between 10 and 25 $\mu W/cm^2$. This discrepancy derives from a different evaluation of the possibilities of the nonthermal effects of microwaves. In addition, some standards of regulation permit higher exposure levels for limited periods of time, while an attempt is also being made to perceive considerations regarding the various other factors that influence the biological response to this frequency band, such as, for example, the environmental conditions, with particular reference to temperature and humidity.

Regarding nonthermal effects, we shall only allude to them here, in view of the fact that they are still under study at present and no universally acceptable theory has yet been formulated for them. Experiments conducted on animals with electromagnetic radiations dosed in such quantities as to permit dissipation of heat through the vascular system, in such a way as to keep the temperature of the organ practically constant, have demonstrated molecular resonances that lead to a modification of the mutual position of the individual molecules, with the ultimate result of denaturation of the tissue. Finally, we mention, among the effects of this type, the so-called "string of pearls" phenomenon, in which several types of cells in suspension in the lymph aline like pearls on a string and remain in this position until the stimulus that caused it ceases (Figure 7).

The Lasers

The lasers are now very well-known, and therefore there is no need here to present a detailed description of their characteristics and their operating

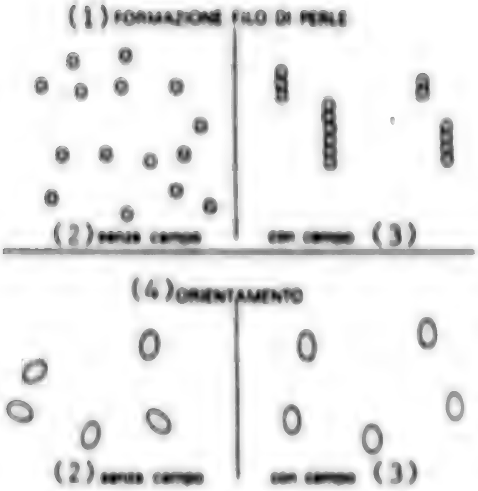

Figure 7. Formation of string of pearls and orientation of nonspherical particle

Key:

1. Formation of string of pearls
2. Without field
3. With field
4. Orientation

principles. We mention only that this acronym (Light Amplification by Stimulated Emission of Radiation) designates those apparatuses that use molecular amplification for emission of beams of coherent light (that is, in phases). Laser radiations are emitted at the frequencies characteristic of of the active medium employed; however, it should be pointed out that frequencies double the original ones can be obtained by the second-harmonic method. At present, laser light beams are produced that go from the infrared to the near ultraviolet and it seems possible to extend this technique to higher frequencies also (Figure 8).

In the naval field, lasers are used for the communications systems, in the radar systems, in missile guidance and control systems, as well as in other applications. Without going into greater technical detail, it should be noted that three types are presently in use, distinguished from one another by their temporal characteristics of emission:

--the long-impulse lasers (Non-Q-switched), which furnish impulses with duration on the order of milliseconds, as in the case of the ruby radars;

--the giant-impulse lasers (Q-switched), which furnish short impulses, with durations on the order of nanoseconds (millionths of a second);

--the continuous lasers (CW), in which the beam is emitted in continuity, such as the gas lasers.

The interaction of laser radiations with living matter is a complex phenomenon and is not yet completely understood; it depends on a great many parameters, such as the characteristics of the tissues exposed, with particular reference to pigmentation and vascularization (which can strongly influence both energy absorption and dissipation of the locally deposited heat), and especially the wavelength, the energy or power involved, the continuous or pulsed nature of the emission (in the latter case, the duration of the pulse), and on the geometric distribution of the incident light on the tissue in question. As regards the type of damage caused by the lasers, in the present state of knowledge the most important kind seems to be damage of a thermal nature, connected with the rise in the temperature of the tissues in the zone of impact, and in the case of the short-pulse lasers, also the damage connected with the creation of acoustic waves or other factors of an athermal nature.

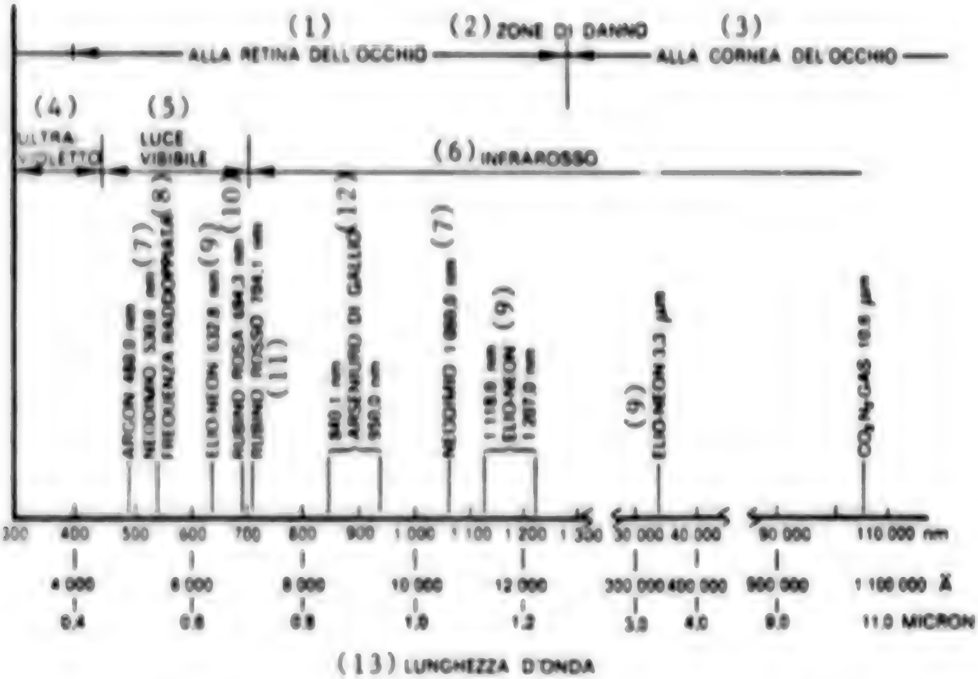

Figure 8. Table of the emission ranges of lasers

Key:

1. To the retina of the eye
2. Damage zones
3. To the cornea of the eye
4. Ultraviolet
5. Visible light
6. Infrared
7. Neodymium
8. Frequency doubled
9. Helium-neon
10. Pink ruby
11. Red ruby
12. Gallium arsenide
13. Wavelength

Considering specifically the case of personnel exposed to such a radiation source for occupational reasons, the eye has the character of a critical organ, in the sense that it is presently improbable that circumstances could occur such as to cause damage to other organs without involving the apparatus of sight. The energy threshold for danger of chorioretinal burns is influenced by a large number of parameters, among which in particular are the diameter of the iris, attenuation of light in the transparent media of the eye, and finally, the disposition of the cornea and of the crystalline lens. Effects on the eye can derive also from the mechanical waves generated by the impact of laser pulses on the tissues, and could cause hemorrhages and retina detachments, as observed in animals.

Laser pulses can also produce--at least in the case of direct impact by beams of considerable energy--lesions of some seriousness on the skin. In addition to the incident energy, the magnitude of superficial lesions depends also on other factors, such as pigmentation and vascularization. As regards chronic exposure of the skin to laser radiations, it must be specified that data are not available in adequate number. It seems nevertheless that a sensitivation mechanism exists. In the present state of knowledge, values for maximum permissible levels for exposure to laser radiations, values deriving from international recommendations or from legislative provisions of national interest, are not available. This is related to the scarcity of knowledge of the harmful effects of such radiations, especially as regards chronic exposure. However, there is no lack of maximum safety levels proposed by various organizations, including private ones, interested in the use of lasers and by various studies on the subject. By way of example, Table III gives the values that relate to laser radiations hitting the retina.

Table III. Safety Levels for Exposure to Lasers

Type of Emission	Energy Flux on Retina	Density of Energy Flux on Retina
Continuous	--	$0.35 W/cm^2$
Long-pulse	$3.2 \cdot 10^{-2} J/cm^2$	--
Short-pulse	$2.7 \cdot 10^{-3} J/cm^2$	--

To conclude, some reference must be made to the systems for protecting persons from laser radiations. Direct viewing of the beam or of the zone of impact must be avoided absolutely, and the eye also must not be in the trajectory of the beam, when the apparatus is ready to function. Individual protection of the eye proper is usually provided by suitable glasses which, while permitting vision, attenuate to tolerable levels the electromagnetic radiations in a frequency band that comprises those characteristic of the laser in question. In view of the breadth of the frequency interval covered by the present lasers, it is obvious that there is no one universally effective protective material. Protective eyeglasses must be designed in such a way as to keep reflected or diffused light from arriving at the eye from any direction.

Protection of the skin concerns mainly the uncovered parts, such as the hands and the face, since the rest of the body is at least partly protected by clothing. For this purpose, gloves or dark cloth or leather are used, while the face must not be turned toward the target zone. Since sufficient data are not available on the possibilities of long-term effects from chronic exposure of the skin to laser radiations, protection of the skin must not be neglected.

Conclusions

From what has been said, it is obvious that the problem of the dangers deriving from exposure to electromagnetic waves (the Anglo-Saxons call them "radiation hazards," or in shorter form, "radhaz") has not been completely solved yet, and that studies and research aimed at deepening knowledge of the effects of such radiations on the human body, and especially at defining their limits with greater precision, are still in progress. We mention in passing that harmful effects are produced also on explosives, on fuels and on certain on-board electronic equipment, and these are also taken into consideration inasmuch as the ineffectiveness of a naval unit may be due not only to the weakening of the crew but also to the fact that essential pieces of equipment are out of service or that explosions or fires occur.

As was said at the outset, dangers subsist also from visible light, from ultraviolet rays and from radio waves of frequency lower than the microwaves, but such radiations are more characteristic of the apparatuses used, and used to a great extent, in the medical, civil and industrial sectors. It is true that these radiations fall outside the limits that we set ourselves in this study, but we cannot help but mention them, in view of the development of such apparatuses throughout the world, involving the daily lives of us all.

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